

BOARDWATCH

MAG

Guide to Internet A

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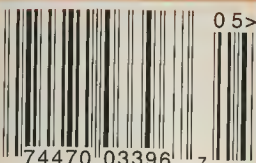
Keeping the Internet from Unraveling

**MCI WorldCom Deal
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Solve Peering Problems**

**Small Town ISP Drives
Away With a Big Hummer**

**Does Netscape Owe
You Money?**

**Michael Gaddis of SAVVIS Communications
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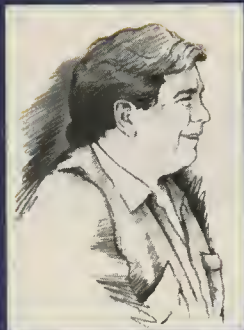
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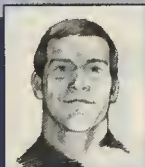
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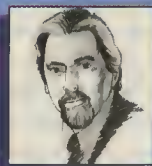
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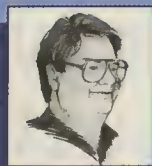
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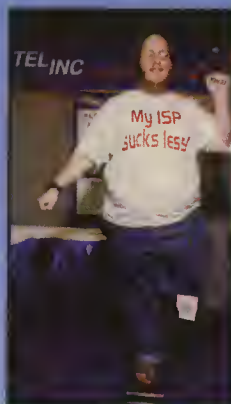
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EDITOR'S NOTES

by Jack Rickard

YET ANOTHER UNIQUE MOMENT IN TIME PEERING REDUX - BACK TO THE FUTURE AND THE ESSENTIALS OF A COMPETITIVE INTERNET

In the beginning, there was an Internet - a bold proposal to link 13 geographically, technically, and organizationally different networks into one linked *supernetwork* spanning the continent at a breathtaking 56 Kbps using Vinton Cerf's Transmission Control Protocol over Internet Protocol. It gave remote access to programs and resources on some of the nation's largest supercomputers. And it demonstrated that you could link very disparate local area networks to do useful, if basic things such as convey electronic messages, transfer files, and login remotely.

The National Science Foundation funded this link and a company titled Advanced Network and Services (ANS) was created specifically to build it, using resources from IBM and MCI. It worked, and it served as both a symbolic and technical center for the unification of all *computerdumb*. It gained sufficient critical mass to break the problem of e-mail "islands" then extant in the commercial network arena, and gradually subsumed all networks everywhere.

At some point, it was no longer a demonstration, and much of the use of the Internet had little to do with academia, or anything the National Science Foundation was chartered to do. The obvious solution was to privatize it - allow private commercial companies to operate it and sell access to it commercially.

A huge brouhaha ensued - a melee of epic proportions. IBM and MCI had essentially built the National Science Foundation backbone, and claimed to have an identical "private" backbone, using the same rooms, same equipment, and same technicians as the NSF backbone. They viewed themselves as the natural inheritors of the Internet and pointed to their considerable investment in developing technology for the NSFNet backbone as sufficient justification for their inheritance.

A small band of protestors howled in rage that a government program funded by tax dollars could be "given" to a private company such as IBM and/or MCI - IBM being the devil incarnate at the time in the personage of Alan Weiss. Rick Adams of Alternet, later renamed UUNET, Marty Shafkowitz and Bill Schrader of Performance Systems International (PSI) and a few others made sufficient ruckus that they too should be allowed to participate in the riches that would flow from privatization.

A mailing list was formed - Commercial Privatization or COMM-PRIV to discuss every conceivable variation of every

conceivable conspiracy between IBM and the NSF - with Gordon Cook, previously of the John Von Neumann Center and destined to become something of the Rona Barrett gossip columnist of the Internet fueling the debate with e-mail mis-sives exceeding the length restrictions of most of the mailer software of the day.

PSI and UUNET largely, though with participation from Sprint, formed the Commercial Internet Exchange to demonstrate network-to-network exchange of traffic, as well as to provide an ostensible shunt around the NSFnet backbone to justify early commercial use of the Internet in the face of the government Acceptable Use Policy. Along with the Metropolitan Area Ethernet's developed by Metropolitan Fiber Systems (MFS), and the Federal Information Exchanges (FIX) the concept of exchange points evolved.

In the end, the domain name and IP address assignment tasks were awarded by contract to NSI, a routing arbiter database contract was issued to Merit, and a series of Network Access Points or NAPs was designated. Originally three, they were awarded by contract to Pacific Bell in San Francisco, Ameritech in Chicago, and Sprint, which was known as the New York NAP though located in Pennsauken, New Jersey. Before it was quite a done deal, everyone seemed to agree that MAE-East in Washington, DC, should be the fourth of the three NAPs.

A bit of a combo problem was left - peering and settlements. And after months of wrangling, it was decided just not to decide it. Anyone who showed up at any of the NAPS could peer with anyone they wanted to, not peer with anyone they didn't want to, and work out any settlement issues they could as best they could. The NSFnet backbone was shut down a year later in April of 1995. The commercial Internet was go and that a basic problem of what it actually was or how it worked was overlooked in the flush of incoming business and money.

PEERING AND SETTLEMENTS

Peering and settlements has proven almost unsolvable on the Internet. Though unsolved, the two continue to be linked intrinsically. Peering is an agreement to exchange traffic and route advertisements at a NAP. The traffic is a bit obvious. If you have a user on one network and a web site on another, in order for the user to receive the web page, Internet Protocol packets have to transit from the one network to the other somewhere. In theory this would be at the NAPs. But in leaving peering an optional item, not all networks exchange traffic

with each other. Traffic must often go through an intermediate network to get there.

The route advertisements are even more key. Routes are paths to a particular Internet resource. If network A doesn't get route advertisements from network B, then no one on network A will know how to get to a web site or resource on network B. Indeed, they just won't appear to be reachable. As a result, peering problems have long made the Internet much less ubiquitous than perceived. Entire portions of the Internet wink in and wink out as seen from any particular location - mostly due to peering disputes and glitches. Customers have been put off with vague explanations of "problems" when they were suddenly unable to see selected resources. The common knowledge that you can reach any point on the Internet from any other point has, unfortunately, never held true for more than a day or two at a time.

The settlements issue, is probably the real heart of all the problems on the Internet today. In the voice telephone network, they simply opted on a simple rule - caller pays. Whoever initiated the call, pays for a long-distance call. And the originating network pays a fee to the termination network. Since calls run in both directions, each network is credited with hundreds of transactions each hour. On a monthly basis, the "balance" is calculated and if there is a disparity, the balance of value is paid in cash as a "settlement."

Even in this simple instance, settlements have a basic overhead problem. Let me spend \$10 to determine that I owe you \$100. You likewise spend \$10 to determine that you owe me \$105. So five bucks changes hands, but we spent \$20 to get there. Fortunately, in the voice network, the charges were dwarfed by what the consumer paid in per minute charges - so we'll pass this madness on to him.

But even in the voice network, settlements are actually undergoing a lot of review and examination right now as a perhaps inefficient concept. On the Internet - it just doesn't work at all. First, none of the customers pay per minute charges. Second, it's devilishly difficult to determine who initiated the call in a technical sense. And the flow of value is almost incomprehensible. Does the dial-up user who contacts a web site gain value because they can contact it? Or does the web site gain value in getting a "hit" from a caller? Which way does the "value" flow in this type of information exchange.

The basic unit of currency could be the number of customers. A network with 100,000 customers might consider access to its network by a network with 500 customers a real value to the smaller network. Now if the 100,000 were all dial-up customers, and the 500 were all huge web sites such as Microsoft, Netscape, Yahoo, and Excite, would this still be true? Is the network providing access to these "resources" the one really providing the value? Or would the first network be providing the second network with a valuable "audience" that they should pay to access.

Traffic analysis only worsens the situation. A "caller" sends a single 1500 byte packet requesting a page to a web server. The web server responds with an 80 KB graphic, seven 8 KB graphics, and a page of text. It is an asymmetric traffic flow to the point of absurdity.

The constant jealousy over who is carrying whose water at any particular moment led to a technical innovation termed

"hot potato routing." In this, individual packets are hosed off onto the terminating network at the earliest opportunity based on the destination address of the packet and without regard to any sort of routing efficiency beyond the fact that "this packet is headed for you and I don't want to pay to carry it another mile." Why that packet is headed that way varies from application to application, of course, and the entire concept, based in greed and malice, makes about as much sense as charging Santa Claus a penny for every packet sent on the Internet as a whole. But



it evolved in this manner. As a result, a page request might cross the entire continent on Sprint's network, and the responding page itself transit the entire continent over MCI's network - ALL of this entirely different from how a ping or traceroute would show the same connection.

And it only gets worse. FTP sites, e-mail traffic, USENET news, with every new application the concept of a flow of value becomes more absurd. The analogy we've used for years, is that two identical twin brothers, each wearing nice suits and the best of intentions, motivated by a million dollar bonus for each of them if they could come to some agreement, could never work out a value exchange system on the Internet. So is it any wonder that nearly 40 backbone networks, with somewhat more complicated motivations, could fail to do so as well? Everybody knows the other guy should pay something. But no one knows what he should pay, why he should pay it, or who the other guy is precisely. It just seems like everyone else is getting a free ride.

So settlements never were settled. And inescapably this leaked into peering. Larger networks felt they were "enabling" smaller networks by peering with them and exchanging traffic and routes. They were providing access to a larger network for free. But it's the same basic moronic argument. Are 200 millionaire customers of less value than 20,000 poor customers? Dial-up users versus web sites? Business customers vs. consumers (complicated by the fact that the business customers obviously WANT access to consumers, and versa visa). I have more customers than you. Yes, but I have better customers - intrinsically more valuable ones. And a third network has but a handful of customers - including PointCast Network, Netscape, and Yahoo. Same leak springing from a different hole.

What emerged was chaos. At four NAPs, some peered with others, and some did not. UUNET, interestingly, was a very promiscuous peerer. For some time, they would peer with anyone with a clue, and some who had no clue, and in some cases helped people get a clue so they could peer. MCI was very reluctant to let all these "lesser" networks peer with them at all. But if pressured by their paying customers, they would. Sprint ran it both ways depending on what period of time we are talking about and who was at the helm. These three networks together comprised most of the traffic on the network. And in a kind of ongoing competitive jealousy bordering on rage, the Internet teetered along with a peering policy that was essentially no policy at all.

Peering is somewhat more complicated at a technical level than quite described above. Giving another network the power

to shoot routes into YOUR network is the analog of a promiscuous commingling of body fluids. The network you peer with has the power to totally WRECK your network - either through malice, or more commonly, error. A couple of mistyped lines and neither one of you are doing much Internet that day. With backbones arising almost as the result of high school student science projects, this gets to chaos pretty quickly. Further, as the number of networks increases, the cost of just managing ports at NAPS to accomplish peering becomes non-trivial. If nothing else, your contact list of people to call when something goes wrong becomes unmanageable, the chances of something going wrong increases dramatically, and the time spent trying to fix whatever went wrong rises in scale. It's just not true as a practical matter that everyone with a 2400 bps modem that wants to dial into a NAP and be a peer can do so.

Last year, UUNET announced an "end to free peering" and an end to the "free ride" and sent dark e-mail messages to dozens of smaller networks advising them they now had to be "customers" and pay for connections rather than peer at NAPs. There was a lot of howling, but in the end, we can't actually find a single case of anyone who lost peering. UUNET wasn't actually able to make it stick. Same by now aging problem. Anyone cut off would cause angst from UUNET customers. Was UUNET disconnecting the smaller networks from the Internet, or was UUNET disconnecting ITSELF from the Internet? It was a bit of a bluff and it largely failed. Made a nice *Boardwatch* cover of John Sidgmore rolling a few barrels of ammonium nitrate up to MAE-East. That was probably the biggest effect it had.

PERFORMANCE

Aside from these ongoing perceptual difficulties regarding peering and value, the four original NAPS have emerged as major bottlenecks to Internet performance. Traffic has expanded enormously, and getting it through the NAPS themselves has proven to be a huge performance problem. With Keynote Systems, we've run over 10 million discrete web page download measurements crisscrossing the network in nearly every conceivable direction. What has emerged is that most of the performance problems appear to be exhibiting themselves in the interconnect space. Two networks can both work admirably across their entire topography. But if you put a client on one and a server on the other, it can look very bad very quickly if you try to time packets crossing the chasm. The NAPS are the lion's share of this problem - they inherently have two many packets in one room.

PRIVATE INTERCONNECT

This gets worse in solution than it ever was just as a problem. The larger networks are choking down bandwidth into the NAPS, and instead working out "private interconnect" solutions. If GTE and MCI are sprouting a lot of traffic in Atlanta between each other, and all of that has to be backhauled to Washington, DC, to exchange it in an already choked MAE-East NAP, it makes economic sense to simply interconnect in Atlanta, swap the traffic locally, and move on. As this grows, however, it contracts the "good old boys club" to a handful of huge networks that develop this private interconnect outside of the public NAP structure. One problem with this is that there is still traffic through the NAPS to resources located on smaller networks, and performance to those sites is egregiously poor. But over time, it is almost inevitable that this

private interconnect space will be seen as anti-competitive and ultimately collusive. It intrinsically allows large players to develop interconnect excluding new entrants and smaller players. It is certainly NOT offered to all comers - or even based on specific criteria. There is only one legal outcome possible, and it awaits really a single lawsuit to become an entirely untenable situation. If you thought school busing was bad, you haven't seen anything until you see an Internet redesign under court supervision.

WORLDCOM/MCI

The thing that has held the peering situation in the air to this point has been a basic balance of power between three large and very competitive networks - MCI, UUNET, and Sprint for some four years now. Mix in some smaller, but historically venerable networks such as PSInet, BBN Planet (now GTE Internetworking) and the commercial version of ANS, and you have a kind of precarious balance that did afford smaller networks and new players an entrée into peering at the NAPS. It was time consuming and difficult to gain peering and even large networks such as CompuServe had actually a tedious time gaining peering at the NAPs initially. But it could be done.

The lingering theory revolves around the concept that one network could become sufficiently dominant to change the game and essentially "steal" the Internet by simply announcing radical change to peering policy. In the past year, some interesting developments have occurred. WorldCom purchased MFS Communications, GridNet, ANS, UUNET, and CompuServe. And in March, shareholders in both companies approved a \$37 billion merger between WorldCom and MCI. WorldCom has acquired enough of the other backbone companies to claim well over 50 percent of all connections to all smaller ISPs, well over 50 percent of the total traffic, and probably close to 70 percent of all business accounts. Complicating this is the fact that most of the other smaller backbones with the exception of Sprint, PSInet and AT&T get their underlying physical infrastructure from WorldCom. And finally, UUNET as described earlier, had already made an abortive run at radically changing the peering balance of power last summer - before having the critical mass to quite pull it off. With the WorldCom/MCI merger, it is widely feared that they WOULD now have the critical mass and would indeed be able to pull it off. Being connected to the Internet increasingly looks analogous to being connected to WorldCom. And being disconnected from WorldCom could look a lot like being disconnected from the Internet.

In February, the European Union (EU) announced they were reviewing the WorldCom/MCI merger and had some serious questions about Internet competition. Within days, the U.S. Department of Justice announced they too were having a closer look. And the FCC has also noted reservations about the merger. It does not seem to be an issue of voice telephone service or long distance telephone service. The entire concern centers on Internet dominance. We've heard quite a bit of surmise that these are largely pro forma and that the merger is due for inevitable approval. Our best information would lead us to believe otherwise. It's probably in a great deal more trouble than commonly believed. At this point, I would rate the chances of unfettered approval as approximately nil. But if a way were found to approve it and ensure everyone of a truly competitive Internet environment globally, it would eventually happen.

ISPCON RAVINGS

I announced at the opening session of the Internet Service Provider Convention that I did not believe the size of the proposed WorldCom/MCI merger was at all the problem and rather surprised everyone in coming out in favor of the merger. Rather, that the extant non-policy peering policy was the biggest threat to the future of a competitive Internet. This rattled a few cages. But I still think it's true. If we consider that the future of a competitive Internet rests on whether or not WorldCom/MCI merge, then we must logically conclude also that other future mergers could similarly threaten a competitive future for the Internet. And if the solution is for the government to review and disapprove this merger, then it pretty much makes sense that to guard a competitive environment, it must also review and approve or disapprove EVERY merger or acquisition of any companies involved in the Internet on a case-by-case basis. I don't think Martha Stewart would find this to be a "good thing." In fact, without even consulting Martha on the topic, I find it to be potentially a very, very bad thing.

And that brings us back to the original problem. How to have a competitive Internet where new players can enter and smaller players can innovate and introduce new products without filleting large networks that have invested hundreds of millions of dollars in their networks. One way NOT to do it is with the current structure where networks show up at whatever NAPs they want, with whatever bandwidth they want, and peer with whoever they want - thus designating who may BE their competitors, under what conditions, and at what bandwidth. It is time to admit in public that this may have got us here, but it just didn't work long term. It happened due to a lack of intestinal fortitude and/or political courage in 1994. It will require a good bit of both to fix in 1998, but it really must be fixed.

I would advocate a radical new peering policy with several major features:

1. Compelled Peering. Exchange participants would be required to peer with similar class networks at the exchange. It would be quite mandatory and quite automatic. Forget costs of "enabling your competitor." They're a cost of being connected to the Internet. If you don't want to pay these largely imagined costs, run a private network for your own entertainment and that of your friends. Don't be surprised if the group of friends turns out to be smaller than you thought. If you want to be connected to the Internet, get onboard this new peering era.

2. Required Bandwidth. Throwing a symbolic T-1 into CIX is not participating in an Internet, nor is it peering. Exchange participants should be required to bring enough bandwidth to handle 120 percent of their traffic at all times - peak - at all exchanges through strict monitoring and rules enforcement.

3. Expanded Number of Exchanges. If voice, fax, and ultimately video are to move onto IP networks, it does not make sense to run all that traffic through four rooms in the United States (or am I alone in thinking this is madness?). Similarly, exchange should not be a secret, accidental network design among those colluding to exclude other players. There are a number of ways to accomplish this. I personally favor requiring all "peers" at the exchanges to also PROVIDE a public exchange on their network with collocation facilities, etc. In this way, as more backbones are added, more exchanges are

added as well. WorldCom could start with about four - one each for UUNET, ANS, CompuServe, and GridNet. We should have a competitive Internet - not a free one where anyone with a dial-up modem can be a backbone. As traffic rises and the Internet must grow, national backbone status is going to have an escalating price in appearing at an ever larger number of exchanges. But there would be room for "regional" networks and other classes of "peers" in a rational order participating at smaller numbers of exchanges.

4. International Peering. What's going on here? Foreign networks backhaul all the way across the ocean to the United States, and THEN have to pay transit to the networks here under the dubious theory that the U.S. network is hauling their water across the continent? Good work if you can get it. But it's an international screw job. Long term we face the same instability. What if they tire of this and disconnect? Four years down the road and it will be the same confrontation, over which CONTINENT has the most customers, the best customers, yata, yata, yata. Deal with this now.

5. Governing Body. If you don't want government regulation, you do need a persuasive form of self-regulation to forestall it. And despite my simple/radical view of peering, there are ongoing issues of practical nature in peering and traffic exchange that don't solve themselves in magazine articles. A real, neutral, governing body must be established to manage the exchange of traffic and route advertisements and deal with the "Jimmy peed in Sally's lunchbox and I'm telling mom" type of issues. The choice here isn't between no regulation and a governing body. It's between an industry body and a government body. For any of those who missed the study group, the correct answer is A.

So I would advocate that rather than stop the merger, let's fix the real problem. Fortunately or unfortunately, the merger question provides us a unique moment in time - a huge opportunity. It's a big merger, with big players. If it were "held hostage" to a new peering policy that guarantees a competitive Internet, then once that is resolved, the merger has no teeth to bite the rest of us, and must be viewed as a pooling of interests to gain certain efficiencies in the marketplace - good sport all around. Let's trade a merger for a long-term viable competitive peering and exchange policy.

PEERING IS CONTROVERSIAL

So there is my take on competition, the merger, and peering. Fortunately or unfortunately, there are a little less than 100 humanoids on the planet whose opinion on peering counts, and guess who ISN'T on the list. Me. And, in fact, a quick survey of all 100 would indicate that less than 0.001 percent of them (some guy's car actually) agree with me on peering at all. Worse, they EACH would seem to have a plan, and all 100 plans are pretty much mutually exclusive as best as I can tell. Herding backbone providers, predictably enough, is again very similar to herding cats with a four iron in a lightning storm. First it's dangerous as hell, you could be hit by lightning. Second, it's noisy as hell, lightning storms always are. And finally, it annoys the shit out of all the cats. Getting them to all actually go in one direction, even if it is to ensure their own survival, is almost impossible.

But one plan did catch my eye. Mike Gaddis of SAVVIS Communications has authored a white paper titled *Brokered Private Peering* that hits most of my shopping list at least a

glancing blow - a little weak on the NAP expansion, but it leaves the door open there and nothing notable on the International issue. But all in all a very good start. It also ameliorates the local loop costs of appearing at multiple NAPs in an interesting way.

Gaddis, and indeed SAVVIS, are a little bit of an area of fascination for me because they inherently think outside the box and seem to find ways of making things work when they don't work. They showed up on the scene with this wacky thing about NAPs nearly two years ago. They created private NAPs and actually bought connectivity to the big three at these locations and don't appear at public exchanges and don't peer at all. I dismissed this as "checkbook peering" initially. But after looking at it, and after noting some superb scores on our backbone performance indexes by SAVVIS, I've become a believer. They have, if nothing else, shown one way toward scaleable performance - an expensive way at this point, but a way.

Politically, they're not in the middle of anything. Nobody even knows much about them. And Gaddis' plan is one of the best thought out we've seen - even in draft form. We are publishing it in its entirety in this issue. Note that it is a very rough draft, very preliminary, and discussions were going on with virtually every major player in the business at our press time.

It's not the first plan, but it does appear to be more sweeping and comprehensive than most. PSINet actually radically altered their own peering policies and announced free peering last fall at ISPCON'97 in San Francisco and were again making hay with it in Baltimore this spring. They had recently gained a lot of OC-48 bandwidth in an equity deal with ICX. They've signed up nearly 125 ISPs with their "free peering" concept but it is somewhat unilateral and inevitably leads to a transit purchase from PSI. According to PSINet Vice President John Kraft, PSI is interested in the BPP Group proposal but was not going to act as a leader on this initiative. They want to see what happens with it.

Not to be outdone, AGIS's Phil Lawlor was quick to point out they have a plan too, and we'll be able to see it as soon as they get it typed up. According to Lawlor, unlike the SAVVIS plan, which is based on ATM, theirs addresses access by EVERYTHING with the lone exception of perhaps FDDI. I almost wish this one would emerge on top just so I could fly out and SEE a network access point exchange room designed by Phil Lawlor.

Similarly, according to Gene Noble, vice president of Business Connectivity Solutions at DIGEX, they are also implementing major revisions to their peering approach to ensure the best connectivity for their customers. They had reviewed the BPP plan and were indeed interested in how it developed, but were not willing to jump onboard the bandwagon at this early stage.

It seems everyone agrees peering needs changes, and they unanimously agree that no one is going to agree on anything. Everyone indicates THEY have a peering plan, though most are not precisely specific enough to be written down, or have much detail.

It's a classic Internet situation - everyone milling around lost, straining to find out which way the wind blows so they can get out in front and appear to have invented it first, and desperate not to appear to be agreeing with anyone else in the meantime. Some days it must feel pretty good to be a John Sidgmore or Bernard Ebbers.

But behind the scenes things are not so dark. A number of new players have come into play or are trying to. Large, but almost silent networks such as AT&T and IBM are increasingly disenchanted by the status quo and the emerging WorldCom/MCI new world order. Infrastructure companies such as Qwest Communications, L3 Communications, and Williams Telecommunications are also wanting to be players as well as virtually all of the regional Bell operating companies. The cobbled together NAP architecture has never appealed to these companies who are accustomed to providing carrier-grade quality assurances to customers who do not understand why they now can't when it comes to Internet services. Williams Telecommunications has come out publicly to be among the "founders" of the BPP Group and both Qwest and AT&T are rumored to be interested. Small backbones such as Exodus Communications and Electric Lightwave have similarly signed on. And Ascend Communications may have stolen a march on the other hardware manufacturers by signing on as an early sponsor of the effort with technical assistance and their Ascend GX550 25-100 Gbps ATM Switch.

One of the drivers behind all of this actually has not much to do with peering per se. There are a host of new *Quality of Service* products waiting in the wings that simply won't work across the existing NAP structure. Everyone is excited about doing voice over IP, for example, but the existing level of quality of voice across the Internet is unlikely to appeal to anyone but experimenters and very strong power users. And there is no way for any one network to unilaterally fix this. Provisions for these sorts of services have to be provisioned in the interconnect space between networks or they just never can quite work.

In our estimation the Gaddis white paper presents one of the best blueprints we've seen for a radical new peering policy for everyone across the network that would probably work. Now if we can just get EVERY network to come out with their own different plan, we can all finally agree on whatever Bernard Ebbers and WorldCom tells us to agree on.

The least we could do is offer a private Peering Summit Meeting (/golf tournament, of course) here in Denver for late May or early June. This would be small, by invitation only, with backbone representatives, a few FCC observers to hover and look concerned, some hardware guys to swear that whatever is agreed could in fact be done, and perhaps some caddies.

Jack Rickard
Editor Rotundus

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discoveries

and improvements

invariably involve

the cooperation of many minds.”

—*Alexander Graham Bell*

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Letters to the Editor

Boardwatch Magazine
8500 W Bowles Ave Suite 210
Littleton Co 80123

LETTERS TO THE EDITOR

Address correspondence to Letters to the Editor, *Boardwatch Magazine*, 8500 West Bowles Ave., Suite 210, Littleton, CO 80123; by fax to (303) 933-2939 or by e-mail to letters@boardwatch.com

SPAM REVISITED

Just read the January 98 letters section where you've tried to explain the logic behind your column on AGIS and SPAM. People aren't getting it because they're talking trees and you're talking trees; show them the forest.

As I see it, the AGIS bashers honestly believe this: They can let the world see ISPs cancel accounts to control spam, not because of laws or lawsuits, but _voluntarily_ because the ISP is a "good citizen", and then expect the world to understand that this was a one-of-a-kind situation and can't be repeated for any other cause. Pornography, abortion, religious issues, and so forth are a completely different thing and they can't be held responsible for data passing through their routers. Only spam was important enough to act on.

Maybe they're right (the "theft of resources" argument) but they don't see it won't matter by then. Nobody will listen or care. If an ISP can pull the plug on a spammer, then why won't they pull the plug on that awful web site I find offensive? Lawmakers will observe that a precedent has been set, they will _not_ care why, and suddenly ISPs are responsible for the actions of their customers. To be good citizens. Voluntarily. Or we'll see you in court.

Think you can convince a judge of the difference between offending someone through "push" technology (email) and "pull" technology (web site passively waiting for the unsuspecting viewer)? I sure wouldn't bet my entire business on it. But several ISPs already have. Once you show the world the power you have, they'll demand that you use it.

Doug

I agree completely Doug. That's the heart of it. We have to disincant the spammers, not the ISPs.

Jack Rickard

♦♦♦

AVID 16 YEAR-OLD ISP TECH READER AND COMMENTS ON 56K

Dear Mr. Rickard:

I'd like to give some of my comments about both your magazine and the 56k modems. After owning my own ISP for a year, and now working as technical support for an ISP, I find your magazine an invaluable resource and I keep all my issues for reference, if its not a good article that month, chances are it will be the next month =). Your magazine is very well rounded and I've been reading it since the BBS days (When it said "Guide to BBS, Internet, and the World Wide Web" on the front =).

Anyway, I work at an ISP using totally Ascend equipment (KFlex) and the new modems seem to cause more grief (for us and users) than speed increases.. Around 25% of our users don't even see any speed increase even after updating the firmware, etc, and ones that do it is only moderate between 30k and 36k anything above that is high. I've talked to two people who get 44k once in awhile.

I think they should just call it false advertising, I am quite happy using two left over modems from my ISP operation and Dialup Networking 1.2 to bond them together.. I surf great =).. and no one here in our office even uses 56k.. Seems they should call it K36Flex...

Kudos on the excellent magazine.. and I guess it does appeal to the younger gen-

eration.. as I never miss an issue and I am 16.

Jeff Smith
Access Nevada Technical Support
prophet@kitfox.anv.net

Jeff:

Anecdotal reports of 56K performance are all over the map – one of the reasons we tackled this very difficult issue in our March report on the call completion tests we ran. Let's say it doesn't work where you're at, and it works REALLY WELL 30 miles down the road. Now is it "false advertising"?

The basic problem is that our telephone network is not nearly as monolithic as apparently everyone, even pretty technically clueful people, might believe. It is enormously variable from place to place, call to call, and more. As best I can tell, ALL the 56K modems and equipment DO work – in some cases. And just as truly, ALL 56K modems and equipment FAIL – in other cases. And it is not quite as simple as the length of the caller's analog line portion of the circuit. In fact, I'm finding the digital side more of a problem than the analog side.

It is a painful evolution, but in truth – mid forties performance is a significant and worthwhile improvement over high twenties performance. A V.90 standard will undoubtedly help. But I fear the help desk at Access Nevada is still going to have some long days this year.

Jack Rickard

♦♦♦

DSL IN SOUTHERN CALIFORNIA

Hello Jack,

Maybe you can help clarify some things for me. It seems DSL is quickly coming

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to Southern California. My understanding is that DSL can use standard POTS lines although they are not directly connected to the analog/digital switch at the TELCO CO.

Some folks have called them Alarm Lines and they used to sell for around \$15 per month. PacBell is now offering DSL in select areas for \$80 per month (I don't know if that is per loop or both loops) for the customer. And \$125 to install.

Considering the speed it sounds like a great deal - yet knowing that an Alarm Line cost around \$15 per month - something just doesn't sit right.

Did I miss something -- does PacBell still offer alarm lines for around \$15 can these lines be used with an ISP to get DSL service instead of paying \$80 per month and \$125 to install?

It also seems the ISPs that PacBell recommends are also charging a monthly loop rate beyond the NET connection (bandwidth). PacBell says the ISP has to go through the PacBell ATM in order to do DSL with PacBell.

Again I question if all of this is necessary or if the its just been reworded and repriced? Can the same service be gotten at two different prices?

Here are some links to PacBell and the ISPs they are working with for DSL service.

http://www.concentric.net/business/dsl/dsl_pricing.html
<http://www.pacbell.com/ir/products/business/fastrak/adsl/pricing.html>
<http://www.dnai.com/services/adsl.html>

Many Thanks,
Brett Tabin
brett@travelersonline.com

Brett:

Sorta/kinda. xDSL is an encompassing term covering the digital subscriber line family. Basically, it is a specific kind of high speed modem that works over unpowered copper lines. These are lines not connected to the telco central office switch, and not powered at all. A modem at one end talks to a modem at the other.

Alarm lines, more widely known as Local Area Digital or LAD circuits, are simply a tariffed offering of unpowered

copper lines not connected to the switch. Alarm companies used to use these to monitor homes and offices.

So the answer to your question is that a DSL service is the same copper wires, but with about \$500 of equipment added to each end to accomplish the data squirt feat. Somebody has to pay for the modems. And someone has to pay for the Internet bandwidth you are connecting to. Ergo the \$80 price above the \$15 for just plain copper wires with no modems, and no Internet.

One of the brewing battles is over ISP's being able to provision those bare copper wires so THEY can offer xDSL as well as the telco. Many of the telcos have detariffed the \$15 alarm circuits in an attempt to shut ISP's out of this market. The FCC is currently reviewing the situation.

Hope this helps.

Jack Rickard

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SOMETHING'S MISSING: HOSTING ENVIRONMENTS

Hi Jack,

A friend of mine and I have been contemplating combining our web sites and we entered into a friendly discussion about whether we should host it at my ISP or his. He bragged that his was pretty well connected to the net, and I thought maybe mine was better connected - but that there was certainly a way we could settle this point, thanks to <http://www.boardwatch.com/ISP/index.html>

I surfed over, and I was a bit disappointed. First, I couldn't find his ISP (<http://www.scruznet.com>), which, given 4,000 ISPs on your list, was a bit surprising. Next, I couldn't really figure out how to evaluate which ISP would be a better deal to do the hosting for our site. I've read a few of your recent articles on measuring performance, but they tend to measure raw download speed, and somehow I have a yearning for more.

Can you include data in a future version of the ISP directory that would help me decide where I might best host my site? You've focused on access, now how about hosting?

Here are a few of the things I'd look for when shopping for a vendor to host my site (I suspect you have a few more you would add): - which web server? - recommended/supported web development

tools? - secure access supported? - Unix / NT / other? - log analysis tools? - disk space/bandwidth deals? (e.g. 20M disk, 200M/day download, \$30/mo) - domain hosting? - mailing list maintenance (majordomo/other)? - private newsgroup (web-BBS) maintenance?

I'd also love to see an article where you create one or more "model web sites" and evaluate ISPs and the deal they would offer to each. For example:

club/hobbyist: 5M data, 100 hits/day
serious publisher: 20M data, 1000 hits/day, web-BBS services
commercial publisher: 50M data, 10000 hits/day, online ordering

Or maybe I just missed it in a previous issue...

Regards,
bill
bfitler@best.com

Bill:

We've missed the point here somewhere. We have SPECIFICALLY measured backbone performance from the perspective of how a web site would look hosted on a specific backbone. In fact, reversing it to say this backbone or that backbone is a good place to ACCESS the web from is not good - not good at all... This test is quite asymmetric in this respect. It can test visibility of a web site from a patterned set of locations ostensibly modeling end user distribution and we think gives some overall indication of backbone performance and connectivity to the "Internet". But it really does NOT indicate one backbone or another would be a good location to run a browser from. No, no, no, no....

To do what you want to do, simply tracer-t to boardwatch.com. The first network you hit that is NOT your ISP is your backbone. We rate 39 of them by performance. And that performance is if nothing else, web site visibility.

We are definitely looking at breaking out a new section within the Directory just for web hosting services. What we're struggling with is the variety of pricing/costing models used, and what YOU would find useful as far as tabular information. But we'll get it done.

Jack Rickard

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ATM

Hello Jack,

There's been too much spam in your letters recently. I get enough in my Email.

Since IP is a connectionless protocol which seems unable to guarantee the latency or bandwidth, many folks are predicting that ATM will be the protocol of choice as data, video, and voice converge on the public network. Nevertheless, IP advocates seem to think that IP can be extended to have a QoS guarantee that will be sufficient for voice.

I don't know how well the voice over IP products of today are working, but I would guess that no one is ready to give up their telephone.

Where do you think it's going. Will the data network and voice network continue to coexist side by side? Will the potential savings in equipment and line charges force a unified network? If a unified network is in the plan, what will ride over the physical layer protocols (which I assume will be SONET and SDH for fiber)?

Bill Fazakerly

Bill:

We are headed for a "unified" network architecture. Packet killed circuit switched. Happened back in the '90s as they say. Don't underestimate voice over IP. It's going to happen. And it's going to cause some serious problems. But it will take several years for all of that to shake out. It will only look sudden to telco executives.

Within that, the ATM vs IP battle is still a quagmire. But the outcome is a hybrid, probably not either one. Currently, inter-city trunking is done almost entirely using ATM. The local fanout is entirely through IP. The junction between the two is problematical. Since companies such as Cisco, Bay Networks, and Ascend now own both, I think you'll see some very interesting hybrids come out of it.

ATM is almost a religion. It has weeny packets and an awful lot of overhead as a percentage and so strikes me as esthetically an ugly protocol. But it's very real and quite here.

Jack Rickard

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ISP ECONOMICS

Upon reading the "Growth and Profits" letter to the editor in January's issue, I felt compelled to reply with a brief explanation of why ISPs concentrate on future market share. The problem is the person writing the letter doesn't understand that selling ISP service doesn't have the same business problems as a factory producing widgets does. There is no such thing and unprofitable growth for an ISP in my opinion. In order for a factory to produce one more widget there is a cost to do so. Signing one more user up to use their service costs nothing because the ISP doesn't have to provide anything to that user. There is a fixed amount of bandwidth the ISP rents from their upstream provider and a fixed amount of modems to divvy up that bandwidth to individual users. Adding one more user or even many more users doesn't cost the ISP anything because all they have to do is create an account for the user to allow them an equal opportunity to consume a fixed resource. However, when the ISP gets enough new users most intelligent owners will decide they are generating enough revenue to be worth investing in increased bandwidth and more modems to divvy up that bandwidth, thus effectively repeating the cycle. Those ISPs investing in future market share are doing the correct thing because growth is profitable and always will be as long as there are more potential users and indeed the user demand seems almost limitless at this point in time.

Doug Croft

Well maybe Doug. But there are some serious problems for ISPs in there. The marginal cost per subscriber is a little more complicated than you make it out. Eventually, additional equipment and bandwidth have to be brought in and the "jumps" are more like cliffs with fairly largish capital requirements. Second, they can't be done in arrears. Telephone lines alone can take up to six weeks to have installed. Equipment is pricey and delivered when it really arrives, not when the salesman said it would arrive. So instead of catching up by adding equipment and bandwidth to handle customers, ISPs have to predict the arrival of customers and have the stuff installed before they get there.

Finally, the scaling thing is ugly. All the tricks that worked to get you to 10,000 subscribers don't work very well anymore after 10,000. All the new tricks you learned

to get to 20,000 subscribers, quit working again. Billing systems, customer support, POP equipment, it changes in steps.

But I agree that ISPs are probably doing the correct thing in investing in growth. I must assume so since that is what they seem to be doing in overwhelming numbers. I guess I would like to see them building relationships with customers that would support more upselling, cross selling, and other channel development possibilities for the day when the trees quit growing to the sky.

Jack Rickard

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RE: YOUR LETTER TO THE EDITOR

SPAM (NOW YOU WON'T READ THIS)
Page 16, January, 1998, issue.

The letter contains a suggestion of charging perhaps a penny per e-mail (either not chargeable, or refundable, if the e-mail is from a selected list of e-mail senders or if the recipient likes the letter and chooses not to charge). The penny could come from a pre-paid account, so there would be no getting by the requirement. This certainly is a good idea and has the potential to cut down on SPAM without involving the courts, the Congress, or the Constitution. It is, indeed, an excellent suggestion.

I must state, however, that I first heard this suggestion perhaps six months or a year ago. It was in a piece written by Elenor Dyson. If I am not mistaken, it was in InfoWorld.

In any event, there is a piece in InfoWorld from Jan 20, 1997 by BOB METCALFE, that discussed just such a solution.

See: (www.infoworld.com/cgi-bin/displayArchives.pl?dt_iwe03-97_22.htm)

Dean Huffman
perinatl@slip.net

I read it. I'm not sure what you're talking about, but I did read it. I do advocate pay electronic mail, though a penny probably wouldn't do much. I do know Esther Dyson. But I missed the piece I guess.

Jack Rickard

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LUCENT: MODEM TESTS FLAWED

Dear Mr. Rickard:

This letter responds to a cover story your magazine published in its March 1998 issue concerning the performance of 56 kilobit per second (kbps) modems, "The 56K Modem Battle." Although we commend your magazine's attempt to provide an in-depth analysis of the performance of 56 kbps modem technology, we believe there are several serious flaws in the report.

First, all of the magazine's tests were done from a single location in Littleton, Colo. This reveals only the performance on a single phone line; it is not possible to extrapolate such data to the rest of the phone network. To attain meaningful modem test results, you would have to test connections between many local phone loops and central sites using several different types of network equipment.

Second, many times a modem will connect at an aggressively high data rate and then fall back to a more sustainable rate. The user is rarely aware of the fall-back. Spot-checking this as Boardwatch did is no substitute for doing real throughput testing.

Third, the correct way to measure data throughput is to do file transfers and calculate the actual speed.

Fourth, other independent comparisons of K56flex (and x2) have found dramatically different results from those your magazine reported. One recent study found that 56K PC card modems with chips from Lucent Technologies achieved the three fastest data transmission speeds in a performance test that included 20 such modems.

Fifth, your article acknowledges that the only modems tested were those from Rockwell and 3Com. Modems containing Lucent's chips were not tested. Therefore, the performance results do not reflect the implementation of K56flex by Lucent. Lucent ranks first in the world in sales of chips for modem-equipped personal computers, and the company is the number one seller of chips for modem-equipped PCs in North America, with more than a 40 percent market share, according to market research firm VisionQuest 2000. Customers include such major PC manufacturers as Compaq Computer, Hewlett-Packard, IBM, NEC, Sony, and Toshiba. Sixth, your article also contains several

other inaccurate references about Lucent. For example, the statement that "Lucent saw an opportunity to get back in the modem chip set game and announced V.flex2" is incorrect. Lucent had been in the modem chip set business for several years before its introduction of V.flex2 56 kbps modem technology in the fall of 1996. The introduction of V.flex2 was not a "re-entry" by Lucent into the modem chip business. Rather, it was a continuation of product offerings for this market that had been underway for several years.

It is worth noting that 56 kbps chips from Lucent are now interoperable with 3Com modems, and Lucent has achieved interoperability at 50 kbps using the new International Telecommunication Union's V.90 standard. That rate is impressive and certainly competitive with any other modem technology available today.

Sincerely,
Craig Garen
General Manager of Modem
Integrated Circuits
Lucent Technologies
Microelectronics Group

Mr. Garen:

We've been over the recent tests a number of times. I'm still uncomfortable with them myself. There are no particular flaws at all in the report. There may have been in the testing. But we're having some difficulty getting to them and we've actually taken every criticism quite seriously. We're still looking.

First, the testing was done from a single location in Littleton, Colorado. That's a feature, not a bug. It's a constant. We have before and since been able to dial and test both x2 and K56flex modems at approximately equal performances over the same lines. We recently completed 14,700 calls to a single ISP here, Peak to Peak Internet, and attained an average reported connect speed of a little over 43 Kbps. Given the 6 percent over-reporting done by the x2 modems, we consider this almost exactly on par with the x2 modems over the same local lines. Essentially, the local lines from our office to the Columbine Central Office Switch in Littleton are very ordinary, and quite treat x2 and K56flex as identically as any line can. The entire results of the tests vary, both with local and long distance calls, as the DIGITAL topology varies. The local analog lines simply do not apply a differential to the different modems as best we can tell.

Second, it is quite true that the x2 modems and the K56flex modems both appear to fall both backward and forward. While interesting, this doesn't tell us much. Our "spot" check involved several hundred calls holding both origin and destination constant as well as doing actual throughput of an identical 831 kbps file. Unfortunately, the ISP tested for the throughput on the K56flex side usually resulted in a V.34 connection. We are re-testing this now. The x2 side did tend to over-report at about 6 percent. And since we can reproduce this result at will, our testing would appear to be quite adequate in this area. It is an easily definable difference.

Third, the correct way to measure data throughput may indeed be to do file transfers and calculate actual speed. That's how I would do it. Beyond the mildly interesting question of the over-reporting, where we indeed did as you describe, we never did report data throughput. That's because we never measured, nor intended to measure, nor intended to report on data throughput. In fact, if you'll read the article you are purporting to respond to, there is no mention of data throughput outside of the discussion of over-reporting. We measured, and reported quite accurately, the reported connect speed. Period.

I have received a tremendous amount of this type of input indicating that we didn't really measure something we know we never intended to measure, never intended to report on, and so, of course, it is a non-sequitur that we did in fact not measure it. We also did not measure drop rates. We also did not measure latency. We also did not measure any number of things, some it would appear, important to our readers. It's very difficult to comment on all the things read into a test that wasn't designed and in fact did not measure all the things wished.

Fourth, other independent tests have obtained different results? So I should not report ours because they differ? Or should I re-engineer ours so they produce the same? Or precisely what are you suggesting? I have read numerous reports of tests, almost all done in labs, and have come to the conclusion that you can derive any results you want from these modems. The newsworthy element of our results is in the first place we weren't after any particular results with regards to reported modem connect speed, or indeed to obtain any results at all in this area. We were measuring call completion rates. Secondly we were doing it in a real

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world scenario across a much broader array of terminations than anything I've previously seen reported. I myself find it remarkable the degree that our results differ from these "other" tests. We, of course, continue to examine our process to look for "serious flaws." I will not comment on the veracity of other tests beyond that. We tested across a minimum of 323 different digital paths spanning the continent and in call quantities of over 140,000. The results are as reported.

Fifth, we specifically noted in the article that no modems containing Lucent chip sets were tested and thus no Lucent K56flex implementation was tested. We are hopeful we will receive a new V.90 modem from our friends at Multi-Tech very shortly that does use the Lucent chip set, and I'm quite anxious to get it into the array for testing. But as yet, we have no Lucent powered client modem to test, and we were quite specific about that in the March article.

I will stand corrected on item sixth, but on a technicality. By "get back in the game" I did not mean to imply that you had discontinued modem chip manufacture and were now re-entering. I was referring to the strong eclipse of the Lucent chip set by Rockwell in the V.34 period, where very few client modem manufacturers used the AT&T, now Lucent, chipset and a very large percentage used the Rockwell chipset. I meant to imply that the PCM modem development offered a window to regain some of the popularity the AT&T chipset once held.

If it helps at all, your veering off onto these topics does not leave you alone. Our readers, among both ISPs and end users, have read things into this report and these tests that simply are not there, and I am at a loss as to what to do about it. It has caused genuine angst among not only hardware vendors but ISPs in responding to conclusions drawn from these tests that simply lack any logic at all. I have reread the article several times and it simply does not say what I'm hearing it says when people react to it. We did not test throughput. It is absurd to select central site equipment based on client modem tests to 90 different ISPs based on reported connect rate and call completion rate. No, it says nothing about latency. It says nothing about drop rates as often as I have heard that we somehow **SHOULD** have tested this. So we've learned a couple of things from the exercise. There is great demand for real-world test data of modems and central site equipment. Further, that peo-

ple want it badly enough to try to read results into tests of entirely different things to get it, even when it isn't there. While reading messages from God in cloud formations is certainly a diverting exercise, I hope nobody is buying stock options based on what they get out of it.

Since the responsibility for accurate communication rests predominantly with the communicator, I have to assume responsibility for it. But I'm struggling here to figure out how to deal with it. We appear to have hit a pocket where the players are ravenous for accurate and timely information. And I have to assume that the conflicting and shrill claims of the hardware vendors have created this confusion and need for rational information. Unfortunately, we now have a shopping list of about twelve entirely different testing scenarios that this readership would love to see run NOW and reported NOW and they each take quite a bit longer to think through, set up, and run than they do to write about. We'll try to work on the lower hanging fruit here and hope it is sufficient.

Jack Rickard

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MISSING THE BBS DAYS

Dear Jack,

Let me start off as most letters start off. I love the mag, I have been a subscriber for a number of years and attended one 'Con. I hope you go on producing this fine publication for many years to come.

I am 15, I have been using computers since I was 8. I have been calling BBSes since I was 9 and I have been a sysop since I was 10. What I want to know is are the good 'ol dial-up bbses gone for good? I have watched the bbs scene in my area (south florida) decline steadily for the last 2 years until it finally died.

I loved running and calling local bbses simply because they were local, there were about 10 popular bbses and all the same people called them, you knew who they were, sometimes you'd see them somewhere around town or in the mall and say hi and they would know who you were. If you were a sysop everyone knew you and you would usually get visiting sysop access on most boards and give other sysops the same on your board. The message bases were interesting conversation that reflected the interests of the users and advertisements were rarely posted in non advertisement areas. I am just sad to see these things disappear....

I find the Internet very impersonal. There are a few people on IRC and in the newsgroups that I know but no one really that lives in my area or that I would recognize if I saw around town. I have found it impossible to find intelligent conversation in the newsgroups without running into tons of cross posted messages, and spam. I rarely post for fear of finding my mailbox crammed with 100's of messages telling me how I can get rich quick or where I can find some hardcore sex site. (which has happened numerous times I have posted)

Finally after half a year of getting about 3 calls a week I gave up and moved my bbs to telnet-only. The bbs is going better now, but no one is really interacting like they were before. Most people log in, download some files and log off. I am still only getting about half the amount of connections I was getting 2 years ago. (about 40-50 calls a day).

I wish somehow both bbses and the internet can co-exist but unfortunately the internet has (at least in my area) killed the good old dial up bbs. Is this the case in other areas? What are your views?

Regards,

Nicholas R. Pinansky

Nicholas:

I can pretty much smell news. The problem I always have is determining whether it is good news or bad news. What you have here is some news, and you find it lamentable. Let's take a look.

BBSes were around from the late seventies until just the past couple of years. It's not just your area, it's all over. But it's not that they didn't have a chance. But they had some problems never solved. The biggest one was abusing callers with a dorky interface that never did seem to get any better. XMODEM? ZMODEM? YMODEM? What's all that about 20 years after the first CBBS came on the scene?

The Internet didn't kill the BBSes. It moved them. And it moved them on two causes. First, it eliminated long distance toll charges. Second, it wiped out all the interface hokey and provided a universal graphical interface that anyone could use. The real BBS operators went in two directions. Most of them put up web sites. The real serious guys became ISPs. The ones lingering and lamenting were by and large those that were also late to the BBS party - not the ones who built it.

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All of that said, I agree that the network is a bit sterile these days. I can find things. I can chat. I can buy stuff. But it is true that the very specialized, very chummy local area message areas don't seem to be around. USENET is a swamp for the intellectually bereft and I applaud that it exists as a service to give those people something to do away from anything I want to do. Mailing lists have largely replaced message conferences, and some of these are truly quite good.

But take your problem and make a million dollars with it. Determine what parts of the BBS world you miss the most, and develop an analog on the Internet that everyone can use. No one is truly unique in a world of near enough six billion people. If you miss it, others do to. If you can then recreate it with a better interface and the ubiquity of the network, others will likewise be drawn to it as well. I do not think that the final "killer app" of the Internet has yet been written. And in fact, I rather share your view that some sort of community centered aspect will emerge in very popular form within the next year or so.

Maybe you'll be the one to write it.

It is perhaps true that real pioneers also happen to be avid students of history. But it is rare that they are so because they miss the good old days. They're usually sorting through the debris looking for useful parts.

Jack Rickard

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WHERE ARE THE INTERNET POLICE?

My favorite public newsgroup, Homesat, served by North Dakota University, has come under attack. A newsgroup poster hacker has been able to assume any e-mail name at will. This plays total havoc with the credibility of any public newsgroup.

Where are the Internet police? Forgery of E-mail names should be a crime.

Michael R. Reynolds, MBA, CPA
3826 S 92 East Pl
Tulsa OK 74145-3446

Michael:

It appears that it is about to become so.

We just received a copy of a bill from Washington State that does in fact make it quite against the law to misrepresent your identity in e-mail - this largely directed at spam meisters who spoof the address of origination in electronic mail. California is at this moment working on basically the same form of bill. I think the cavalry is coming Michael, but slowly.

And slowly is good. We want to exercise great care on what gets regulated on the Internet. The law of unintended consequences may very well be greatly amplified in such an environment.

I wrote an article nearly four years ago now on how easy it was to spoof an originating address due to the incestuous nature of the SMTP mailers of the day. Unfortunately, no one that could do anything about that did much about it, and today it causes some very serious problems - as predicted.

Jack Rickard

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HAPPY CABLE MODEM GUY

Hi Jack,

After reading the March issue and the reader letter of the Cable Modem Myth, I just had to respond to give a little data from an actual Cable modem subscriber. My area is served by Time-Warner communications who parent tries to buy the world. Anyway, I left my employer last month who paid the extra \$\$ for a second phone line whereas paying the \$20 for a dial-up ISP made sense. Since being a single line person again and not wanting to subsidize my local phone company out of my own pocket, I had Roadrunner service installed.

It is \$40 a month which includes modem rental and great documentation on Internet resources. It IS fast.. Download IE4.01 in about 15 minutes instead of overnight. Of course if the site is busy no matter what method you use for access will be slow. The connection is constant, I have been connected for the past two weeks with no interruptions.

The only negative is the extra resources/memory the network protocols take. I had a 64meg NT4.0 installation on my PP200, after installing the software my available memory shrunk by 15meg causing the pagefile to be

accessed. Bought another 64 and its a screamer.

Great mag, keep it up!

Bruce Donnally
Bdonnal1@tampabay.rr.com

Bruce:

Sounds like a resource hog in more ways than one. But a standing connection with impressive speed would certainly be worth \$40 to me. Most of my questions with cable center around how widely it can be deployed, and whether the wider body of dial-up users would pay the \$40 to get it.

Jack Rickard

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KNOW YOU COULD DO IT

I just wanted to tell you how grateful I was to see your in-depth article comparing the 56K modems. This was the article I knew you could write. It was detailed and insightful. When you first started discussing the 56K modems, I knew you would go into your labs and come out with the definitive answer to the question "Which one should I buy?" The answer didn't surprise me, as I had wonderful experiences with the USR Courier modems when I ran a small BBS. I was also hesitant to buy a modem, fearing that I would not be able to upgrade it as improvements were made. As it turns out, my fears were well founded. Keep up the good work.

A loyal subscriber.

Ian Gilbert
iang@trellix.com
support.trellix.com

Thanks Ian. This was a difficult one to stay on top of because of the constant stream of disinformation available. I think it's going to be difficult to do right through V.90. We'll do the best we can, report it as we find it, and move on.

I do think it's worthy of note that all of these modems appear to me to be somewhat sensitive to the network topology on the DIGITAL side, perhaps even more than on the local loop side which is just the reverse of what you would think. It's not just that your mileage MIGHT vary from our tests, it almost certainly WILL given the very wide range of digital topologies across the country. But in testing across a fairly wide range, that was

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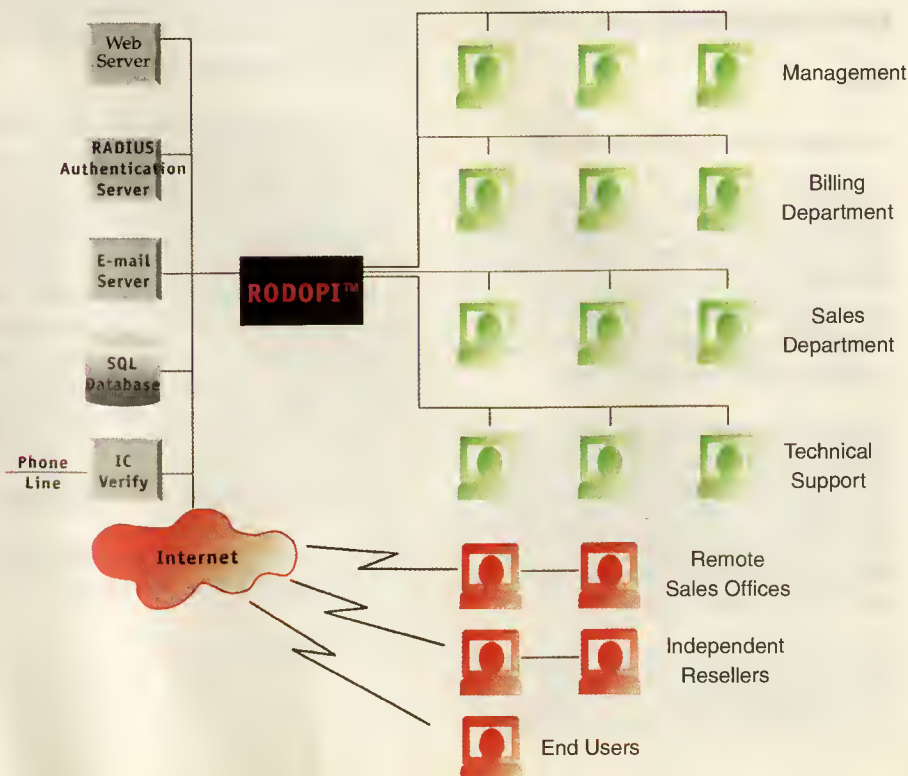
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what we found. We're going to repeat here this month on 100 ISPs, and I myself am a bit curious as to how it will turn out.

Jack Rickard

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SPAM MAIL

Jack,

About 2 years ago you had an article that talked about switching domain names illegally and we were part of that article as one that had this done to them.

I am writing to you as the owner of both a Hosting service Intent Net (<http://www.intent.net>) and Prosperity Central (<http://www.prosperity.com>). Since you had that article in the magazine we have not had any trouble with that, but about every couple of months or so we get a rash of spam mail hate letters from people who think we are spamming their accounts. The spammers use such things as abundance@prosperity.com, unlimited@prosperity.com yours@prosperity.com and the latest step@prosperity.com. We have sent 1000's of letters out to people explaining that we were not the one's sending the email and that they should check the headers of the email very closely so that they can find the actual person or service provider that has sent the email to them.

You can see that this is a long and drawn out process and costs us a lot of time and effort to try and stop this from happening. At this point we have shut down any use of prosperity.com for email except one or two. We know that there could be legal action to take care of this but are not sure what we have the right to try to enforce. We would like to know if you could talk about the victims of spam in an article. In addition we have a great following for Prosperity Central from members of some of the online services such as AOL, MSN and the like. What these people do not take into consideration is how the headers are written to show who originated specific email spam. In turn we end up trying for weeks and sometimes months to get our web server for Prosperity Central where we can send email to legitimate people who have requested more information about color readings, the Enneagram or any of the other services and products that are within Prosperity Central. We would love to know who we need to contact in order to cut through all of the long distance calls

we have to make to get it where we can send email to those people within AOL or other online services or major ISP's. Also how to keep this from happening other than completely shutting down our site. We receive over 100,000 hits per month on Prosperity Central from people in 72 different countries. A large portion comes from AOL when these spams come through it stops some of that flow of people.

What Can We Do?????

Thank you for your time,

Rick Hogue
President
Intent Net
<http://www.intent.net>
VP, Prosperity Central
<http://www.prosperity.com>

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Rick:

It's a real problem. At this point, it is probably best legislated and in both Washington and California it's pretty much a done deal. I would like to see this legislation done nationally. The good news is that you can recover expenses fairly easily under these laws. I think this will dramatically decrease the occurrence.

If it makes you feel any better, it's happened to us as well on several occasions.

Jack Rickard

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POP DIALER AVAILABILITY?

Jack,

As always, keep up the good work!

First off, I was quite surprised by your results in the 56K modem battle article. We use an Ascend Max TNT to provide K56Flex access in our area, and the average connection speed that we observe is 46-48K. We have had customers connect as high as 56K, but that is rare.

When we started with K56Flex, we used US West's advanced (trunkside) DSS service and were unable to make K56Flex connections at all until the trunk class in the switch was changed by US West. We also use ISDN lines now and they work fine as provisioned by US West.

Also, K56Flex is very sensitive to the client modem flash ROM version - version 1.12 seems to work much better.

My real question is: Have you considered making POP dialer program available so that we could run it against our own lines?

Also, perhaps a future comparison of 56K could include a breakdown by manufacturer on the server side (Ascend, Livingston, etc..).

Secondly, in the article on LAD circuits, the "LADS status in US West States" lists Washington as withdrawn on September 17th. It was withdrawn after the Executive Director of the Washington Association of Internet Providers (<http://www.waisp.org>) sent a letter to the Washington Utilities and Transportation Commission objecting to the application. I did send E-Mail to you at that time, but received no reply.

Mike Jackson
President, TSCNet

Mike:

We're finding some very interesting things in the way the T-1 lines are terminated at the ISP central site. If this isn't done correctly, some pretty horrible things happen. We're working on a very techie article on dealing with this right now.

The last time I was in the software business was with an assembly language UUCP program I wrote titled the Personal Internet Mail Processor - PIMP. It was actually sufficiently successful that about half my office was working full time answering questions and providing support for it. I really don't want to be in the software business.

But we have had a number of requests for the POPDIAL program. Since I wrote it to work here, a good bit of it is hard-wired. For example, it always looks for the database, no matter what machine it is on, on the L: drive. That would have to be made configurable along with a couple of dozen other similar things. It really ought to have a login function to go ahead and get on the server and download a selected file - it won't be released for fifteen minutes before I hear that. And it leads to an endless series of "couldn't you get it to do x" questions.

But if I can get some time, I will take a look at cleaning it up for release.

Jack Rickard

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DIAL-UP TESTING PROGRAM FOR SALE?

Jack,

I am a product manager at Ariel. Your article in the March issue entitled "The 56K Modem Battle" refers to a dialing program you wrote for testing modems. Would you be willing to share that program or sell it? It sounds like it would be useful in our load-testing lab for our central site modem products.

Let me know.

Don Rodriguez
Tel: (609) 860-2900 x343
Ariel Corporation
Fax: (609) 860-6343
2540 Route 130
e-mail: don.rodriguez@ariel.com
Cranbury, NJ 08512
<http://www.ariel.com>

Don:

Same answer as above. We're working on it but it's a hard trip.

Jack Rickard

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US WEST, BELL CANADA AND LADS

Dear Mr. Rickard,

I just received my March issue of Boardwatch. (I bought a subscription. No moochers here.) The magazine, as always, was very informative. What really caught my attention was the article concerning the fight with US West over their elimination of the LADS tariff. It bears an eerie resemblance to the fight Canadian ISPs are waging against Bell Canada.

In case you're not up to speed with this, six months ago Bell Canada filed and was granted a tariff for xDSL. Bell is a government sanctioned monopoly and is the only one who can supply this service to ISPs. This established the cost of the service at about \$200.00 per month, to be charged to the Internet provider. Four months later, one ISP, Simpatico, (owned by Bell Sygma,) announce ADSL service for \$70.00 a month. Bell is funneling money from one pocket to the other.

ISPs from across the country are starting to band together, forming organizations to combat Bell's anti-competitive practices. One such organization is the Responsible Internet Service Companies (RISC) which was created to fight the ADSL issue specifically, (of which I

am a member.) RISC has written an open letter to John Manley, Minister of Industry, requesting a parliamentary inquiry into Bell's predatory practices.

My question to you is do you have any plans to discuss this issue in next month's publication? I believe that we have to bring this to the forefront.

Thank you for listening,

Stephanie Donovan
Account Manager
Achilles Internet

Stephanie:

Bell Canada and the telecom environment in Canada is an even rougher game than it is down here. I don't know which month's publication we're on here, but we do continue to cover the dance between telcos and ISPs, and ISPs that are now becoming telcos, and indeed telcos that are now becoming ISPs on an ongoing basis within these pages.

Jack Rickard

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NO OFFENSE, BUT YOU'RE ALL WET

Dear Jack:

No offense, but you're kind of 'all wet' in your response to Nate Bridges of ValleyNet Services, Inc. Granted, Nate should be using digital circuits to provide better service for his clientele, but that is no guarantee that 'Useless Werst' will deliver! We converted to digital circuits 18 months ago as a result of a settlement we obtained through the Idaho PUC. We have been giving US West forecasts, and orders, since then, but rarely have circuits gone in on time.

The latest fiasco happened in February 1998 - we had one T-1 due with another due approximately 2 weeks later - which suspiciously coincided with the beginnings of a massive ad campaign aimed at converting users from 'unreliable' services to US West's new service (their radio and TV spots also alluded to their competitors' busy signals - how convenient!). Our representative had told us that our new circuits would not be available until sometime in April 1998, or at least 45 days after they were due. We couldn't wait, so we posted a 'help-us' banner on our Web site which explained why customers were getting busy signals, gave out our two Senators' email addresses and phone numbers along with

the same for our PUC Commissioners, the Idaho State Governor, and the Idaho State Attorney General. After those entities were bombarded with US West complaints, and after us receiving at least 4 overtures from various US West representatives asking us to take the banner off - we refused - our circuits were installed 6 days later. The moral of this story is 'If you operate an ISP in US West territory, be ready for any and all delays on any and all types of circuits'. For those of you that have local competition, I'm jealous!!!

Regards,

Michael A. Lukes,
CEO, RMC Internet Services
www.rmci.net

Michael:

I'm all wet most of the time. I was not attempting to indicate there are no problems with US West, or that they're above what Nate was describing. But it was frustrating to see him struggle with something he shouldn't have been struggling with.

But I probably should go further. It may be that US West has nefarious plans to strangle ISPs in the night while they roll out their products. But more commonly, what we're finding is a failure to communicate. US West is not as centralized and monolithic as most ISPs imagine. It's more like a country. ISPs who have no account rep, who call the business office, and react to what "Myrtle at the service desk" tells them, are a bit out of the reality zone here. Myrtle doesn't know. She never is going to know. And what she tells you may or may not be so. She's doing the best she can.

The ISP market has some unique and often techie requirements. US West has basically set up a group to deal with ISPs and try to service them. I actually detect some desire to deal with them as a market and as a customer base and try to do a good job of it. You might try working with them a bit to see if they can cut through some of the stuff and get you an account rep that can make things happen.

Contact info:
Jonathan Gray
Market Manager
Internet Service Providers
5090 North 40th Street, Room 270
Phoenix, AZ 85018
Phone: (602) 351-6037
FAX: (602) 954-5439
E-mail: jgray@uswest.com

Jack

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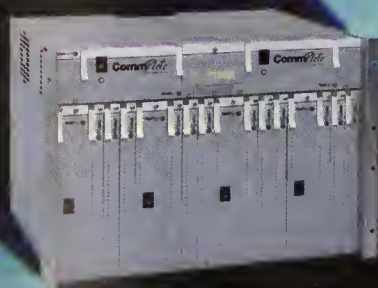
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Author: Michael Gaddis, Savvis
Contributors: Kevin Moss, Electric Lightwave
Rob Bowman, Exodus
Matthew Bross, Williams
Tom Nolle, CIMI Corporation

Internet Backbone Peering

Introduction

The commercial Internet was founded upon the same peer-to-peer interconnection paradigm as the NSF sponsored Internet. During the transition from the government sponsored Internet to the commercial Internet, National Internet Service Providers (NSPs) built large national and international networks that connected to public exchange points located in San Francisco, Chicago, New York, Washington, D.C., and elsewhere. The public exchange points (Network Access Point (NAPs) or Metropolitan Area Exchanges (MAEs)) acted as major data inter-exchange points from 1993 through 1997. This system is sometimes referred to as the "public peering system."

The public peering system has struggled to keep up with the growth of the Internet. When the system was established, few rules were created that governed interconnection. Requirements to provision additional bandwidth to meet usage growth were not established. Guidelines on which networks should peer and under what conditions were also not established. The result was a somewhat ad hoc interconnection system that has, to date, been unable to adapt effectively to the growth pressures applied to it. In particular, the public system has not been responsive to the need to create high-quality business-specific Internet services and Virtual Private Networks (VPNs) built on the NSP infrastructure.

The public peering system is being gradually augmented with a system of private interconnections between national providers. A private interconnection is typically a dedicated DS-3 or OC-3 local loop directly connecting two networks. This is in contrast to a public peering connection. In public peering, a network connects to a shared inter-exchange point at the MAE or NAP such that many peers will be mapped to its network on each link. Private interconnections are referred to as private peering and the emerging system as the "private peering system."

Private peering began as a series of local cross connects between large NSPs at the public MAEs and NAPs to bypass the congested LAN switches that anchored the public exchange points. The benefits of private peering became immediately apparent. Private peering provided better control of the peering process, as well as improved configuration and bandwidth management between the connected peers.

An obvious outgrowth of the "local" private peering bypass interconnection at the public MAEs and NAPs was to create peering connections at any mutually convenient point, to free these peers from any geographical restrictions. As the bandwidth exchange requirements between large networks grew, new capacity was installed in geographically distributed cities to allow more efficient Internet routing. This was the birth of the private peering system as it is found today.

For all its improvement over public peering, the private peering system isn't perfect. One problem that hinders the transition from public to private peering is the cost of the additional local loops required to interconnect each network. For very large networks this cost is easily justified because the connections are filled with peering exchange data from their true peers. For smaller networks this cost becomes a barrier to entry to the privately peered network.

Other factors may also limit NSPs' ability to enter into peering relationships. Private peering has evolved as a rather exclusive club, generally available only between two NSPs that were clearly peers from the point of view of size and/or bandwidth exchanged. Smaller NSPs tended to get locked out of the private interconnection system because of the aforementioned lack of true peer definitions at the MAEs and NAPs. Over time, this exclusivity has created a two tiered system at the public MAEs and NAPs with the "good" bandwidth kept for true peers in private peering and the "not so good" bandwidth (due to its heavy congestion) left to the shared interconnect of the legacy MAE or NAP peers.

For many smaller NSPs the quantity and the quality of exchange bandwidth at the MAEs and NAPs decreased dramatically during 1997 compared to the overall growth in Internet bandwidth demand. This polarization of bandwidth quality impacts many users of the Internet, and threatens the diversity in the Internet that the multiplicity of service providers has created.

For this reason, Savvis Communications, Williams Communications, Electric Lightwave and Exodus have partnered to sponsor the creation of a Not for Profit Corporation called "The Brokered Private Peering Group" (The BPP Group). The BPP Group is chartered to create a private peering system that will allow any eligible network to provision for and obtain quality inter-exchange peering bandwidth.

Brokered Private Peering Overview

Brokered Private Peering (BPP) is an Internet peering exchange architecture whereby three or more peering partners interconnect to an ATM switch in distributed locations. The peers at a given peering location connect via a DS-3 (minimum), OC-3 or OC-12 loop running multiple virtual channels, one for each peer. The model for the BPP is to create, via the shared ATM switch, a shared interconnect with dedicated bandwidth at fractional physical circuit speeds such that the virtual circuit between two peers operates like a dedicated local loop connection. With this architecture, all of the benefits of private peering are achieved without the increased local loop connectivity cost because one physical loop to the shared switch serves all peers. Furthermore, rules are established which maintain this effective circuit-level performance over time, allowing large scale growth in Internet peering bandwidth while maintaining overall network quality.

The ATM architecture is also suitable for the creation of virtual circuit interconnection between peers who wish to offer multiple Internet service grades, or who want to offer VPN services that span NSP networks. The current NAP/MAE public peering structure has no capabilities in this area, and it is doubtful that such capabilities could be added.

An important goal of the interconnect is to create a zero loss, low delay, high availability peering system. Participants are required to manage their bandwidth professionally and to routinely provision more bandwidth as needed to handle growth. This requirement to provision dedicated inter-exchange peering bandwidth is a fundamental requirement of a member of the BPP Group.

The BPP Group also establishes a peering taxonomy to provide a clear classification of which networks are true peers and which are not. True peers are required to offer peering to other true peers unless this peering requirement is waived by the BPP Group governing body. Peers which are classified as operating within different peer classifications can obtain true peer status by following inter-class peering requirements. If these requirements are met by a peer to gain true peer status in another classification group then that group must offer peering as if it were a true peer within that group. The purpose of the peer classification system is to establish a sound economic interest for true peers to exchange bandwidth and to protect true peers from any requirement to peer with "non-true" peers except on a purely voluntary basis. However, in order to create a truly egalitarian system, mechanisms exist within the BPP Group for different peering classes to gain qualifications as a true peer in another class. The intent of these mechanisms are to provide a fair and reasonable exchange of bandwidth with built in economic incentives so that an enduring and adaptable system can be created.

When two peers exceed the bandwidth assigned to their virtual interconnect the BPP switch provider and the peer participants are expected to (1) increase the bandwidth on the virtual connection or (2) if the bandwidth exceeds 50% of the capacity of the local loop transfer the interconnection to a dedicated local loop or increase the capacity of the local loop into the BPP (i.e. from DS-3 to OC-3). If a dedicated local loop is used to accommodate the increased interchange bandwidth between two peers, the peers leaving the physical BPP are still considered members of the BPP, retaining all applicable rights and privileges. The bandwidth management model and agreements survive this private peering transition from shared BPP to dedicated BPP interconnect.

If peers elect to provide special services between their networks (premium services, VPNs, etc.), the bandwidth for these special services must not impact the core peering application. Some special services may require dedicated bandwidth between peers who elect to offer such service; the provisioning of this bandwidth through the shared BPP switch will be treated as a separate peer relationship in this case.

The requirement to bilaterally provision peering interchange bandwidth as usage increases recognizes the importance of the exchange point. Specifically, each peer has typically spent considerable resources delivering data from their customers to the exchange point. Discarding data at the exchange point is, therefore, very wasteful. It is the BPP members belief that peering exchange points should never be resource overbooked or congested. (This is in marked contrast to the present public peering system.) Brokered peering becomes, therefore, a living trust, allowing peer networks to scale their bandwidth commensurate to their growth into the foreseeable future. This trust eliminates peering as a barrier to Internet network growth or performance and provides a level playing field for all Internet carriers to compete.

BPP Group Organization

The BPP Group has not yet been formed as a corporation with legal standing. This section represents a framework for the future establishment of the BPP Group corporation.

The organizational structure of the BPP Group consists of a Board of Directors (BoD), a Technology Advisory Board (TAB), a Director and supporting staff, BPP exchange point providers, BPP backbone providers and BPP peers. The BoD governs the operation of the BPP Group and ensures its compliance to corporate by-laws and corporate mission. The TAB governs the technical operations of the BPP Group and establishes rules of operation and peering within the charter of the BPP Group. The Director and staff carry out the day-to-day operations of the BPP Group under the direction of the BoD and TAB. The BPP exchange point providers (3 planned) operate the BPP exchange points under contract to the BPP Group within the specific operational guidelines established by the BPP Group. The BPP backbone providers (3 planned) will connect the BPP exchange points with high speed long haul circuits to provide connectivity between BPP exchange points. The backbone connectivity will be used to support the ability of a peer to have a virtual presence at many BPPs with physical connectivity to a few as only one BPP. Finally, the BPP peers are the members of the organization that utilize the services of the BPP exchange points or the BPP backbone.

Specific by-laws governing the relationship of all organizational elements will be detailed at a later date.

Membership Criteria

Because of the requirement to bilaterally provision bandwidth as usage increases, it is important to match true peers at the BPP. Without this careful matching of interests between peers, it is unlikely that peers will maintain the quality focus expected of BPP members. This has been the root cause of many of the peering problems in the public peering system because these real or perceived differences create different economic incentives to peer (or not to peer). Therefore, the BPP membership recognizes the differences between national ISPs (NSPs), regional ISPs and local ISPs.

Additionally, the BPP membership recognizes differences between web-centric service providers, access-centric and dial-in centric service providers. The rules of the BPP are designed to match true peers to true peers in a fair manner to create mutual peering interests that are sustainable over time.

The BPP peering model has a strictly ordered hierarchy based on models of national, regional and local peering. Networks that qualify for national peering may peer on any level, regionally qualified peering service providers may peer at the regional or local level within the territory to which they are assigned. Networks that qualify for local peering may peer at the local level only. (However, voluntary peering between any network provider is never disallowed.)

The initial BPP Group offering will concentrate on NSPs and U.S. national private peering because that is where the most acute problem lies in the Internet at the present time. The BPP Group will address other peering requirements of the hierarchy at a later time. Therefore, membership in the BPP will be limited to those commercial networks that qualify for national peering classification at this time. (Expansion of the BPP Group into International connectivity will be studied by the BPP BoD and TAM at a later time.)

The following two sections will define a primary classification of a service provider as a national, regional, or local provider with a secondary, sub-classification type as an access, dial-in, and web-centric provider. Once those service provider classes are delineated, we define the size criteria required to be designated a true peer within each sub-classification group. Finally, the recommended requirements for each class to cross-qualify as a true peer in another class are detailed so that a network provider can achieve a fully peered (true peer) status in all classes.

The goal of this classification system is to determine, as objectively as possible, guidelines for which networks should be compelled to peer and which networks should not. For those networks not yet big enough to qualify for full peering, this qualification system provides a roadmap to build to in order to achieve full multilateral peering qualifications in the future.

"True Peer" Taxonomy and Classification System

Primary Classification

The primary classification system differentiates U.S. national, regional and local providers. A national provider must possess the following attributes to qualify for designation as a BPP national peer:

- **Infrastructure:** National network infrastructure (owned or leased) with ability to provide commercial Internet access or transport to the commercial customers coast-to-coast in the continental United States. The typical BPP NSP will have a presence in at least 5 large metropolitan areas spread coast-to-coast but must have a physical presence and sell commercial Internet services in at least four of the six BPP defined regions.

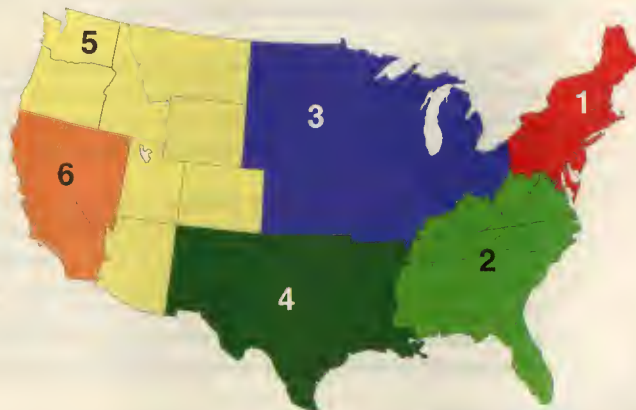
- **NOC:** Professionally staffed Network Control/Operations Center manned 24 hours a day, 365 days a year.

- **Competence:** Must possess the engineering skills to operate a distributed Internet peer interchange with multiple providers.

Regional ISPs are providers that do not qualify for national NSP designation and that span at least two large metropolitan areas in one or more BPP regions. Local ISPs are those that cannot meet the qualifications as a regional or national provider. Exceptions to these designation rules can be approved by the TAB with BoD oversight.

These classification rules only apply to mandatory peering classification. Voluntary peering is allowed between any two members at any time.

Any commercial network that qualifies for national peering status may join the BPP Group as a member. Commercial networks designated as regional and local may not join the BPP Group until the Group opens regional and/or local peering capabilities.



BPP Group Defined Regions

Secondary Classification

All BPP members are sub-classified as one or more of the following service provider types: Business access oriented, consumer dial-in access oriented or web-centric. The terms access, dial-in and web-centric will be used to describe each category respectively.

The secondary classification is used to recommend rules for interconnection that can equalize the cost/benefit playing field between web-centric and access/dial-in service providers to provide a sustainable value proposition for long term bandwidth inter-exchange.

A service provider is considered web-centric if it sends more data than it receives by a factor of 3-1 through the BPP exchange point. A service provider is considered an access provider if it is not web-centric and sells at least 25% (of gross revenue) of its services to businesses or other ISPs at the fractional T-1 or above speeds. A service provider is a dial-in provider if it sells primarily (greater than 50% of its gross revenue) as dial-in and/or cable modem Internet service to consumer oriented customers. A service provider may be designated as both access and dial-in centric.

The next section will use the primary and secondary classifications to establish recommended rules for matching true peers to true peers by taking into account service provider commercial customer size (defined within each category). This method of defining true peers will then be used in the follow-on section as a method to define recommended bandwidth inter-exchange rules between true peers of each service provider class.

Class Based True Peer Classification

Peering is not a welfare system. The size of an ISP matters when comparing peers to determine "true" peers. When a service provider reaches a certain critical mass it makes sound economic sense for other true peers to exchange bandwidth with that peer. However, when a large commercial customer mass disparity exists between two similar peer types (same primary and secondary classification) tensions can arise due to a perception that the smaller network is not providing value to the larger network sufficient to cover the costs associated with peering. (Free peering is a misnomer, there are many obvious and not so obvious costs associated with a peering relationship even if there is no money exchanged for the bartered bandwidth.)

The following table defines the minimum qualifications for each NSP category to be designated as a true peer in order to qualify as a service provider for multilateral (mandatory) peering within that classification.

| Primary/Secondary | Requirement | True Peer Status |
|---------------------------|---|---|
| National access peer | Minimum of 1,000 revenue generating business access circuits at fractional T-1 (minimum of 256 Kbps) or above speeds. Must have a presence in at least one BPP exchange point in all six of the BPP regions when this size is reached to remain a BPP member (the "no lurkers" clause). | True peer in national access class |
| National dial-in peer | Minimum of 300,000 revenue generating consumer dial-in, cable modem or equivalent type of consumer oriented accounts. | True peer in national dial-in class |
| National web-centric peer | Minimum of 200 dedicated computer web-centric host accounts that collectively "push" greater than 500 Mbps for more than 5 hours a day. | True peer in national web-centric class |

If a BPP peer does not (yet) qualify for true peer status then the true peers in their respective categories are not compelled to peer with them. The smaller BPP peers have the option of (1) negotiating free peering or (2) paying for peering or (3) buying transiting connections from another network. When a BPP peer reaches true peer status those connections must be converted to a true peer relationship using the multilateral peering agreement status afforded to true peers. The connection through the BPP peering exchange points may be used for smaller networks to purchase bandwidth from true peers during this growth and transition period.

Inter-Class True Peer Classification

The following table defines the minimum qualifications for each NSP category to be designated as a true peer in another class in order to qualify as a service provider for multilateral (mandatory) peering within that classification. This mechanism establishes rules for BPP peers in one classification (for example web-centric peers) to qualify for true peer status in another classification (access or dial-in peers) so that those peers must honor multilateral (mandatory) peering with those peers that meet the minimum qualifications.

| Primary/Secondary | Requirement | True Peer Status |
|---------------------------------------|--|---|
| National access true peer | Ability to peer in all six BPP peering regions. | True peer in national dial-in class |
| | Ability to peer in all six BPP peering regions. | True peer in national web-centric class |
| National dial-in true peer | Ability to peer in all six BPP regions to at least one of the access true peers BPP exchange point locations in each region. | True peer in national access class |
| | Ability to peer in all six BPP peering regions. | True peer in national web-centric class |
| National web-centric true peer | Ability to peer in all six BPP regions to at least one of the access true peers BPP exchange point locations in each region and willingness to accept regional address announcements from access true peers. | True peer in national access class |
| | Ability to peer in all six BPP regions to at least one of the dial-in true peers BPP exchange point locations in each region and willingness to accept regional address announcements from dial-in true peers. | True peer in national dial-in class |

More than one BPP exchange point may exist in each BPP region. The table above defines an explicit hierarchy for which true peer class must expend the effort to reach the other true peer in the peering region in order to gain true peer status. The BPP Backbone Providers have been commissioned to make this requirement relatively painless to web-centric and dial-in true peers by setting up mesh interconnects between BPP exchange points. Through this capability, a web-centric or dial-in centric national service provider may appear "virtually" at any exchange point.

Peering Rules

Peering is direct across level-2 virtual circuits, no level-3 route services are currently provided by the BPP exchange point provider. The development of enhanced services (RADB etc.) to be collocated at the exchange points will be studied at a future date by the TAB or an appointed committee.

The development of standardized routing interchange modalities will be studied by the TAB or designated working groups of the BPP Group at a future date. At the present time, peering interoperation rules are left to the individual peers to decide.

Operating Principles

The interconnect between peers is modeled as a dedicated bandwidth connection at fractional DS-3, OC-3 or OC-12 or greater rate. Each peer is expected to professionally manage its ingress and egress bandwidth to achieve zero data loss between each peer. **The current technology model for the BPP level-2 interconnect is ATM.** The rest of this document will detail how that technology will be used to provide the service quality demanded by the BPP peering model. **The use of other technologies for BPP interconnect is for further study.**

The minimum bandwidth assigned for a peer-to-peer interconnect will be 5 Mbps equivalent SCR with Peak Cell Rate (PCR) set equal to SCR. The ATM service type will be VBR.

At such time that peering bandwidth exceeds sustained (more than 2 consecutive hours a day) peak transfers exceeding 70% of the assigned fractional Peak Cell Rate (PCR) bandwidth (sampling period of 5 minutes) then the PCR bandwidth should be increased by the BPP exchange point provider and each peer in order to make room for the increased utilization. Bandwidth will be increased in increments of 5 Mbps SRC/PCR up to one half of the effective link rate (minus link framing overhead). When sustained peering exchange bandwidth exceeds 70% of one half of the effective link rate then it is expected that the peers will move their peering connectivity to a direct peering relationship (directly connected via dedicated local loops) or expand their peering link rate accordingly. In either case maintaining low latency and zero loss must be achieved.

The BPP service provider will automatically provide weekly and monthly bandwidth reports to all peers for each peer virtual circuit. It will be a cooperative process between the peers and the BPP service provider to recognize a port approaching capacity and arrange for movement off the BPP to dedicated private peering or to increase link capacity. Reports on individual peers inter-exchange bandwidth will be kept confidential by the peers and the BPP exchange point provider unless explicit written permission is granted by each party to disclose the reports. Aggregate reports of the BPP exchange point bandwidth and operational performance that do not detail BPP members specific statistics may be made public by the BPP exchange point operator if approved by the BPP Director and TAM.

Method of Interconnect

Each BPP peer must connect to the BPP ATM switch with a minimum of a clear channel DS-3. Connections between peers will be established with a Virtual Channel Connection (VCC) or a Virtual Path Connection (VPC) in increments of 5 Mbps Sustainable Cell Rate (SCR) using the Variable Bit Rate (VBR) ATM service class. A separate VCC or VPC will be established for each peer. This will create a meshed interconnect such that for each physical port, a peer will have (possibly many) dedicated VCCs or VPCs for each peer they have agreed to or are required to connect to.

Location of BPPs

Savvis Communications and Williams Communications will act as two of the three BPP exchange point operators (one operator position is open). Initially, BPPs will be located at eight geographically distributed locations. Savvis will support BPP exchange points in New York, Chicago, Dallas, and Santa Clara. Williams will support BPP exchange points in Washington D.C. and Los Angeles. Locations in Atlanta and Seattle will be hosted by Savvis or Williams if a third provider is not located. Additional locations in Boston, Miami, St. Louis, Denver and Phoenix are possible if approved by the BPP TAB or appointed committee.

Williams Communications has been designated as one of the BPP backbone providers. Two other backbone providers are being sought.

Responsibilities of BPP Exchange Point Provider

The BPP exchange point provider is responsible for provisioning one or more approved ATM switches (the TAM will designate approved equipment) for BPP cross connects. The providers will provision ports for members, coordinate local loop installation and set up the virtual channels through the switch to connect peers. The BPP exchange point provider is responsible for all day-to-day activities to insure the smooth operation of the exchange point in order to maintain carrier class operations as delineated by the following SLA.

The BPP exchange point provider will commit to the following Service Level Agreement:

- No greater than 20ms average latency across each participating peer virtual circuit.
- No congestive packet loss within the BPP ATM switch. Loss due to line errors is excluded.
- Non-maintenance related virtual circuit availability from peer demarcation point to peer demarcation point of no less than 99.99%. The peer demarcation point will typically be at the cross connect between the peer's local loop and the exchange point provider's ATM switch. This excludes announced scheduled maintenance.
- Announced scheduled maintenance (at least 24 hour notification requirement) will only be performed between the hours of 2:00 a.m. and 6:00 a.m. on Tuesdays and Thursdays.
- Maintenance and non-maintenance down time will not exceed 30 minutes per month.

If any elements of the SLA outlined above is not met then 25% of the monthly port fee will be forgiven for that month. The peer must notify the BPP exchange point provider within 30 days for credit.

The BPP exchange point provider's Network Control Center (NCC) will act as the clearing house for BPP announcements that affect multiple peers. Peers may use the NCC to notify attached peers of scheduled maintenance, unplanned outages or other important information that affect the peering community at a particular BPP exchange point.

Responsibilities of BPP Backbone Provider

The BPP backbone operators will work with the various BPP exchange point operators to connect the BPP via ATM "clouds" to provide VCC and VPC interconnectivity between one or more BPP exchange points. This service may be used by BPP peers to gain a peering presence at a BPP exchange point where they may not otherwise have a physical presence. The use of the BPP backbone service is wholly optional.

The BPP backbone provider will commit to the following Service Level Agreement:

- No greater than 50ms average latency across each participating peer virtual circuit connecting two peers between two BPP exchange points.
- No congestive packet loss within the BPP ATM "cloud." Loss due to line errors is excluded.
- Non-maintenance related virtual circuit availability from peer demarcation point to peer demarcation point of no less than 99.99%. The internal ATM mesh connecting the two BPP exchange points must have sufficient re-route capability to guarantee automatic re-route within a target mean time to re-route of no greater than 5 seconds. The demarcation point will typically be at the cross connect between the backbone provider's local loop and the exchange point provider's ATM switch. This excludes announced scheduled maintenance.
- Announced scheduled maintenance (at least 24 hour notification requirement) will only be performed between the hours of 2:00 a.m. and 6:00 a.m. on Tuesdays and Thursdays. Internal backbone provider mesh maintenance that does not directly affect the port or loop connecting the BPP exchange points to the BPP backbone providers ATM mesh will not be considered maintenance events. (ATM Mesh re-route capabilities should be able to provide for non-service affecting internal maintenance.)
- Maintenance and non-maintenance down time will not exceed 30 minutes per month.

If any elements of the SLA outlined above is not met then 25% of the monthly service fee will be forgiven for that month. The peer must notify the BPP backbone provider within 30 days for credit.

Responsibilities of Peers

In order to encourage carrier-class peering between professionally managed NSPs, peers will commit to the following Service Level Agreement (in addition to any SLAs agreed to in the bilateral peering agreement between two BPP peers):

- No congestive packet loss at the router closest to the private peering point.

■ Provisioning of additional bandwidth in a timely fashion in access circuits (60 days), attached routers (60 days) or virtual circuit configuration (10 days).

■ Attached router availability of 99.9% excluding scheduled maintenance.¹

■ Timely notifications (within 24 hours) of scheduled maintenance to the BPP service provider so that notifications to attached peers can be made.

Consistent and sustained (over 120 days) disregard of the above SLA can be cause for termination of BPP peering access at that exchange point and/or termination of BPP Group membership.

Additionally, peers in the BPP will agree to work towards a maximum of 100ms end-to-end latency (one direction) from the ingress edge of one peer through the BPP exchange to the egress edge of another peer.

Technical Details

- 1) DS-3 Local Loop Properties:
 - Line Code: B3ZS (clear-channel DS-3)
 - Cell payload scramble: enabled
 - Physical Link Control Protocol (PLCP): enabled
 - Transmit clock source: loop-timed (from BPP service provider)
 - Maximum Bandwidth 40.704 Mbps
- 2) ATM Properties
 - VBR Permanent Virtual Circuit (PVC) or Path (PVP)
 - ATM Forum Compliant UNI Version: 3.1 (3.0 can be used as option)
 - VPI/VCI: 1/32, 1/33, 1/34 etc.
 - ILMI & Signaling: disabled at VCC level for PVC and at VPC level for PVP
 - OAM alarms: segment OAM only enabled
 - EFCI marking: enabled
 - HEC single bit error correction: enabled
 - ATM VBR traffic shaping: peer router must be capable of shaping to the established SCR/PCR rates.

Fees

All fees associated with each local loop connecting a peer's network to the BPP will be paid by the peer.

A small installation and port fee will be paid to the BPP service provider to cover hardware and operating expenses. The fees are: \$3,000 installation fee (one-time at install or when physical port changes are requested, such as an upgrade to OC-3) and \$2,000 recurring monthly port fee for a DS-3 circuit, \$4,000 recurring monthly port fee for an OC-3 circuit, and an \$10,000 monthly port fee for an OC-12 circuit. A de-installation fee equal to 40% of the monthly port fee is also required on disconnect. These prices will be subject to change but only if approved by the BPP TAB and BoD.

Fees for long haul bandwidth between two BPPs provided by a BPP backbone provider is subject to further study.

Modification of This Agreement

Changes to this agreement can be made only by the unanimous consent of the BPP founding members after initial sign-off of the founders. This document will provide the basis for the specification of the bylaws of The BPP Group Corporation at which time the operation and rules will be controlled by the BoD and the TAB.

Confidentiality

Disclosure of BPP Group peer membership shall be public information. However, specific peering connectivity at the BPP shall remain confidential. Specific BPP peering relationships can only be disclosed by the BPP Group or by member companies with the written permission of the each BPP member of the peering pair. Agreement to disclose BPP general membership does not imply agreement to disclose peering pairings within that membership. Similarly, two members may agree to disclose their peering relationship without disclosure that the connectivity is through the BPP.

Termination Rights

A BPP member may terminate membership and connectivity with 90 days notice without cause. Maintaining connectivity between the peering partners established between the terminating peer to other BPP peers is the responsibility of the terminating peer. Any costs associated with the disconnect (such as local loop termination fees) will be borne by the terminating peer.

¹ Dedicated computer accounts mean a single web hosting customer on one or more computers. This excludes smaller web host accounts that share a computer resource. Also, a large web host account that use more than one physical computer counts only once.

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UTILITY COMPANIES TO PROVIDE INTERNET ACCESS

Six electricity providers in Europe and Asia plan to offer Internet access by transmitting signals over regular power lines, a technology dubbed Digital PowerLine, or DPL 1000. The co-developers of the technique, Northern Telecom Ltd of Canada, and United Utilities PLC of the U.K., reached agreements with RWE and EnBW of Germany, Vattenfall and Sydkraft of Sweden, Edon of the Netherlands, and Singapore Power.

The six companies will test the new service for about four months before launching it commercially in the third or fourth quarter.

DPL 1000 allows data communications, including Internet traffic, to be transmitted over electrical power distribution networks at speeds of more than one megabit per second, Nortel claims. DPL 1000 consists of a network interface at the substation, a data unit on the side of the subscriber's house, and a stand-alone communications module.

Applications over DPL 1000 are planned to support bundled information and energy services. Examples include high-speed Internet access, multimedia, home automation and security, online banking and shopping, data back-up, and planned IP telephony.

Europe has not embraced the Internet as the U.S. has, partly because of relatively high local phone rates. If DPL 1000 delivers as promised, Europeans may be tempted to tap into the Internet via their low-cost electrical lines. DPL 1000 also promises to deliver Internet access speeds up to 10 times faster than ISDN.

At a press conference in London, Nortel and United Utilities also confirmed the creation of a joint venture, NOR.WEB DPL, to develop and market the DPL 1000 technology. Each company will take a 50 percent stake in the company, which will develop and market DPL 1000 equipment, software, and services. John Beckett of United Utilities will serve as chairman, and Steve Pusey will serve as chief executive officer.

Nortel announced that as of March 25, 10 international utilities have signed commitment agreements to NOR.WEB's initial deployment of DPL 1000. The potential market through these initial agreements is more than 35 million homes in seven countries in Europe and Asia.

PRODIGY TO FOCUS SOLELY ON INTERNET ACCESS

DOMAIN NAME REGISTRATION COSTS FALL



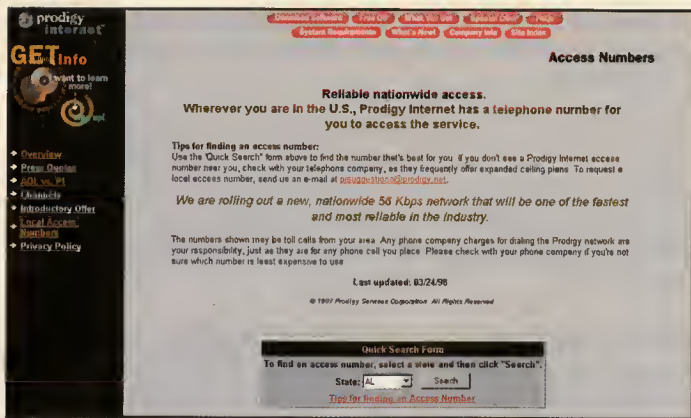
NSI Chief Executive Officer Gabe Battista

Network Solutions, Inc., currently the registrar for Internet domain names ending in .com, .net, and .org, announced the elimination of the Intellectual Infrastructure Fund portion of the fee charged for domain name registrations and renewals. The elimination of the Infrastructure Fund portion of the registration fee is set forth in an amendment to its cooperative agreement with the National Science Foundation.

Effective April 1, registering a new domain name will cost \$70 (instead of the prior cost of \$100), and annual renewals will cost \$35 (instead of the prior cost of \$50).

Gabe Battista, CEO of Network Solutions, Inc. said: "Eliminating the Infrastructure Fund portion of the fee will have no impact on Network Solutions' revenue and earnings, since it was set aside in a separate account and was never included as part of our revenue."

Network Solutions, Inc. also registers Internet domain names ending in edu., as well as providing networking consulting services for businesses. For more information, visit its web site at www.netsol.com.



Prodigy announced March 23 that it will bank its future on providing flat rate, high-speed Internet access. The company announced its 100 percent digital, 56 Kbps, nationwide network will begin its rollout. By the end of May, 80 percent of the U.S. will be able to access the network, the company said.

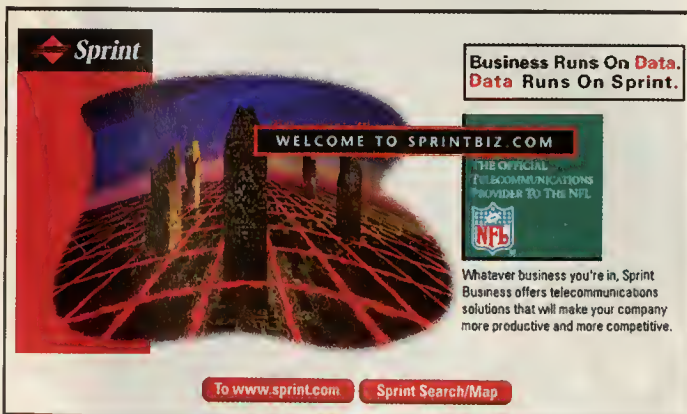
Prodigy said it will hold to its \$19.95 monthly Internet access rate and offer a money-back, no-obligation annual contract for \$15.75 per month. Prodigy Senior Marketing Vice President Jim L'Heureux said "We have a business model where we can make money at \$19.95." Prodigy said the company added more than 100,000 new customers in the fourth quarter of 1997.

Prodigy spun off its networking facilities to a new company and negotiated a cap on its future network costs. Prodigy has also outsourced its content to Excite, Inc. Excite will offer Prodigy users a customized start page at login.

"We realize the best place for us was to be a marketing and sales machine," L'Heureux said. Prodigy plans to support the rollout of its new network platform with television and radio advertising.

Full details of Prodigy's new pricing plans are available at www.prodigy.com, or by calling 1-800-PRODIGY.

SPRINT COMPLETES 100TH RING IN SONET NETWORK



Sprint announced on March 23 the activation of its 100th fiber ring on its Synchronous Optical Network (SONET). The ring is 973 miles long and runs through Chicago, Akron, Columbus, Cincinnati, and Roachdale, Indiana

SONET rings allow rerouting of traffic around cable cuts, outages, and equipment failure in 50 milliseconds, or less than the blink of an eye, Sprint said. The network is built with four-fiber, bi-directional, line-switched, survivable rings with protect fibers and electronics. Currently, more than 85 percent of Sprint's services have moved to the SONET ring architecture.

"While turning up our 100th ring is a milestone for Sprint, we are dedicated to moving all traffic to our SONET network," said Marty Kaplan, senior vice president and chief technology officer. "We anticipate having approximately 170 rings in service by the end of this year."

Sprint first announced its deployment of SONET rings in March 1994. In June 1995, Sprint's first coast-to-coast route became operational, connecting California with New York. The first international route was completed in June 1996. The route ran through Springfield, Massachusetts; Buffalo, New York; Montreal, Quebec; and Toronto, Ontario.

For more information about Sprint's SONET ring architecture, see www.sprintbiz.com:80/data1/sonet/sonet1.html.

MOTOROLA AND 3COM ANNOUNCE LITIGATION SETTLEMENT; CROSS-LICENSE AGREEMENT

Motorola, Inc. and 3Com Corporation announced they have settled the federal lawsuit related to their respective, high-speed, analog modem technology patents.

In connection with the settlement, Motorola and 3Com announced they have entered in to a cross-license agreement for all of their respective patents covering technology required for compliance with the International Telecommunications Union (ITU) analog modem standards. The cross-license agreement includes the new V.90 standard and the V.34 standard.

Under the agreement, Motorola will be licensed to use any further patents covering technology essential for 56 Kbps modems that are issued to Brent Townshend, a Stanford professor, whose inventions made possible analog modems faster than 33.6 Kbps. Last year, 3Com obtained exclusive rights to Townshend's patents on these inventions.

CONCENTRIC NETWORK ADDS THREE EXECUTIVES

Concentric Network Corporation, based in Cupertino, California, announced on March 26 the addition of three technology experts to its executive team. Joining Concentric will be Martin Levy, as vice president of network technology, and Fred Schreiber, as vice president of human resources. David Schairer has been promoted within the company to vice president/chief systems architect.

Martin Levy joined Concentric in February 1998 after the acquisition of InterNex Information Services, Inc., where he was vice president of technology development. In 1996, he served as the chief network engineer at CMG Direct Interactive, the parent company of Lycos, GeoCities, and PlanetDirect. From 1994 to 1996, he founded and operated a small ISP on the central coast of California.

Fred Schreiber also joined Concentric in February of 1998. Most recently, he served as the director of corporate human resources operations at Lucent Technologies, Octel Messaging Division. Previously, Schreiber operated a human resources

consulting firm and spent three years as director of human resources at Pepsico, Inc.

David Schairer joined Concentric in May 1994 while the company was based in Michigan. In 1994, he was promoted to technical director of Internet services, and served in that role until this recent promotion. Schairer is now responsible for the overall software and system architecture of the Concentric network.

WILLIAMS SEEKS TO ENFORCE RIGHT TO PURCHASE WORLDCOM FIBER

Williams Communications, is seeking a declaratory judgement ordering WorldCom to fulfill the agreements in a 1994 contract between the two companies, including a provision that gives Williams the right to purchase capacity through WorldCom's fiber optic network.

The multi-count lawsuit, filed March 20, asserts WorldCom has failed to comply with key elements of the contract in a way that could harm Williams in the telecommunications marketplace.

Williams sold its WilTel Network Service to WorldCom in January 1995, and signed a three-year, non-compete agreement. When the non-compete agreement expired earlier this year, Williams re-entered the telecommunications market with a \$2.7 billion plan to deploy a new, national, fiber-optic network. Williams said it has major projects under way and plans that will expand its network to 18,000 miles by the end of 1998, and 32,000 by the end of 2001.

Williams also claims to be the nation's largest-volume transporter of natural gas, and also provides energy and communications services.

In the 1994 contract with WorldCom, Williams claims it retained a fiber strand throughout the 11,000-mile, former WilTel network, that it can use to transport multimedia traffic, including Internet traffic. WorldCom has challenged Williams use of the 11,000-mile fiber strand for multimedia traffic.

Williams also asserts that WorldCom has failed to cooperate in a project to reconfigure the network to isolate the strand of fiber owned by Williams. Williams claims the reconfiguration of the WorldCom network cannot be completed unless WorldCom participates in implementing a comprehensive, cooperative plan.

Williams also asserts WorldCom has unilaterally removed Williams equipment, used Williams fiber, and threatened to shut down portions of Williams network.

In another count, Williams asserts WorldCom interfered with Williams relationship with a potential customer by refusing to assign network contracts as part of an overall network management agreement.

The lawsuit asks the court to compel WorldCom to comply with all provisions in the 1994 contract, and pay unspecified, compensatory damages to Williams.

ISPs: LOOKING FOR A REMOTE ACCESS SERVER THAT IS FASTER, MORE RELIABLE, & LESS EXPENSIVE?

Look no further! Computone's IntelliServer **PowerRack** is exactly that! In comparison to Livingston's Portmaster, the PowerRack has a per port capacity of **921.6Kbps** (Portmaster -- 115.2Kbps), the PowerRack can support **16-64 PPP lines** (Portmaster -- 10-30), the PowerRack's average price per port is \$60 for 64 ports (Portmaster -- \$97 for 30 ports), and the PowerRack has a **5-year warranty** (Portmaster -- 1 year), **FREE** lifetime technical support and software upgrades, and a 30-Day evaluation option.

The PowerRack also has the standard feature list: dial-in/dial-out access, a powerful RISC CPU, Ethernet connectors, ISDN capability, PPP, SLIP, CSLIP, *bootp*, *rlogin*, *telnet*, reverse *telnet*, PAP/CHAP authentication, RADIUS II, RIP II, SNMP MIB II, subnet routing, IPCP DNS exts. for Windows 95, and IP filtering.

PowerRack user and Internet Service Provider Michael Behrens, of InterNet Kingston (mbehrens@kingston.net), commented, "The PowerRack is an attractive product, both in its ability to do the job well and to do the job... cost effectively. Port for port costs are significantly lower than the Livingston Portmaster. The product lives up to its name... performance under load is exceptional! The PowerRack also offers a significant feature for feature comparison against the available competition (i.e. Livingston Portmaster). And, technical support was extremely knowledgeable and responsive."



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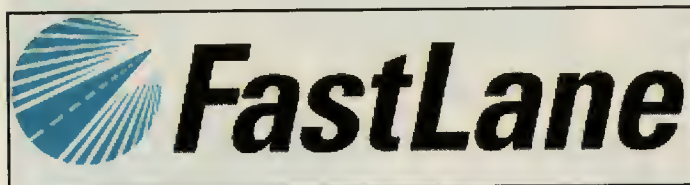


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SPECTRUM'S FASTLANE AVAILABLE TO ISPs FOR FREE TRIALS



Spectrum Information Technologies, Inc. is offering free trials of FastLane, a real-time software server that provides Internet service providers with a competitive advantage by speeding the delivery of rich web content to their dial-up subscribers including those with 56 Kbps modems.

FastLane compresses images on the fly, and there is little if any noticeable difference in the image to the end-user. The end-user has the option of toggling the software on an off, so that images may be downloaded at their full resolution if desired. FastLane works with any browser supporting the use of an HTTP proxy server.

FastLane is a server-only product that operates transparently with standard World Wide Web browsers and servers. Based on Spectrum's proprietary Intelligent Pipe software technology, it employs "Content Management Agents" to transform in real time the data sent over an Internet connection.

Based on standard Internet protocols and architecture, it provides two to three times the web image downloading speeds achievable with standard browser technology, the company said. FastLane requires no software or hardware installation on the subscriber end, and works with all standard browsers.

It can be offered as a premium service or as a standard service and costs about \$3 to \$5 a month per customer, although the price may vary depending on the length and type of contract. The product also offers improvements to corporate Intranets, particularly in remote, dial-up user applications.

Spectrum President and CEO Donald J. Amoruso said Spectrum plans to locate a proxy server near the core of a backbone to make the product as convenient as possible for ISPs.

FastLane currently runs on the Microsoft Windows NT 4.0 platform and operates seamlessly in a UNIX environment. Third party caches and connections of up to 128Kbps are supported. It can be hosted at an ISP site or at the same site as the web server, and is fully compatible with 14.4/28.8/33.6 Kbps and 56 Kbps modems.

It has been extensively stress tested for reliability. In the event of a software problem, a proprietary "safe fail" transition algorithm ensures the only impact to subscribers would be a return to standard downloading speed.

Trial versions of FastLane are available for ISP testing. ISPs interested in trying the product can contact Chris Wraight, vice president of marketing, at (508) 460-5013, Ext. 17, or e-mail him at cwraight@spectruminfo.com. more information is also available at www.spectruminfo.com.

QWEST, VERIO SIGN \$100 MILLION CAPACITY AGREEMENT

Qwest, a multimedia communications company building a national fiber optic network, and Verio Inc., one of the nation's largest full-service Internet companies for businesses and institutions, announced April 1 a seven-year, \$100 million contract by which Verio will have access to capacity on Qwest's domestic 16,285-mile Macro Capacity Fiber Network.

Qwest's planned domestic 16,285 mile network will serve more than 125 cities, which represent about 80 percent of the data and voice traffic originating in the United States, upon its scheduled completion in the second quarter of 1999. More than 3,600 miles are activated from Los Angeles to Columbus, Ohio. Qwest (Nasdaq: QWST) is also extending its network 1,400 miles into Mexico with completion slated for late third quarter 1998.

The Qwest Macro Capacity Fiber network is designed with a bi-directional, line switching OC-192 SONET ring architecture. Upon completion, the network should offer a self-healing system that provides security and reliability by allowing instantaneous rerouting in the event of a fiber cut.

Founded in 1996, Verio Inc. is a national provider of Internet connectivity and enhanced Internet services with an emphasis on small and mid-sized businesses and institutions. The company has rapidly established its national presence through acquisition, integration and growth of local and regional Internet providers that together currently serve 33 of the top 50 U.S. markets.

IRS TO U S WEST: SPLIT-OFF'S TAX-FREE

The Internal Revenue Service ruled April 2 that U S WEST's proposed split-off into two separate companies will be treated as tax-free, for both the company and its shareowners.

The split-off proposal, announced last October, calls for separating U S WEST's two major operating units into different publicly traded companies. After the split, the 14-state telecommunications and directory publishing operations will be known as the new U S WEST. The domestic cable-TV and overseas operations will be known as MediaOne Group. Currently, the two units are tracked by separate classes of company stock, but owned by a single parent company. Stockholders will vote on the break-up in early June as part of a regular annual shareowner meeting and the company hopes to complete the split by mid-June."

A majority of the owners of each of U S WEST's two classes of common stock (NYSE: USW, UMG) must approve the proposal. A proxy statement, of the terms and conditions of the split, is under review by the Securities and Exchange Commission. Once the review is complete, the proxy will be mailed to shareowners before they're asked to vote.

U S WEST, Inc. is the parent company of two major operating units and provides telecommunications services to 25 million customers in 14 western and midwestern states. MediaOne Group is involved in domestic and international cable and telephony, wireless communications and information services.

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Cyclades-PR3000

The Cyclades-PR3000 uses the new Motorola MPC60 processor to deliver unrivaled power performance and offer flexibility that let you change or add new interfaces as they are needed. It comes with 8 MB of DRAM (expandable to 64 MB) and 2/4 MB of Flash Memory.

The Cyclades-PR3000 has one LAN Interface and 3 Expansion Slots where you can install any combination of:

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It routes TCP/IP, IPX and SNA (Q2 9B) and also supports RIP, OSPF, NAT, RADIUS, TACACS, PPP, Frame Relay, and X.25.



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On April 2, a federal judge in Southern California awarded Playboy Enter prizes, Inc. what is believed to be the largest Internet-related damages award to date, in connection with the unauthorized use

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by a commercial Web service of almost 7,500 Playboy-owned images.

The \$3.74 million award, plus attorneys' fees and court costs, was assessed against San Diego-based Five Senses Productions and its owner, Francesco Sanfilippo.

Playboy said the decision is especially notable from a legal standpoint because it treated each use of the 7,475 Playboy images on Five Senses' Web site as an individual copyright infringement, rather than limiting the violations to the number of magazine editions in which the images appeared.

Five Senses' web site began operating in May 1996 and includes a subscription area and a free area, which advertises images accessible on the subscription portion of the site. Previously included in the subscription area were thousands of Playboy images scanned from the pages of Playboy magazine and the company's newsstand specials, and stored in a digital format easy to post and view on the Web.

Playboy said after Five Senses ignored numerous warnings, federal marshals raided Five Senses' San Diego offices and seized computer hard-drives and CD-ROMS containing Playboy images. The April 15, 1997, raid is believed to have been the first of its kind in the field of Internet copyright law. A week later, PEI and Sanfilippo agreed on a preliminary injunction that prevented Five Senses from using Playboy images until the suit was resolved.

In issuing her order last week on Playboy's motion for summary judgment, U.S. District Court Judge Irma Gonzalez ruled that each of the Playboy images had an independent economic value and was worthy of protection.

**WINSTAR RECEIVES CLEC
CERTIFICATION IN FOUR
ADDITIONAL STATES**

WinStar Communications, Inc. announced April 3 that it received authorization from the states of Alabama, Montana, Nevada and South Carolina to provide competitive local exchange carrier (CLEC) services. In addition, WinStar and Ameritech announced interconnect agreements covering the states of Ohio and Wisconsin.

The CLEC authorizations allow WinStar (NASDAQ-WCII) to provide a full array of telecommunications services in competition with the incumbent local exchange carriers. WinStar now has CLEC certifications in 33 jurisdictions, representing 48 of the largest U.S. markets including: Arizona, California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, Washington and Wisconsin, in addition to Alabama, Montana, Nevada and South Carolina.

The interconnect agreements establish the terms under which WinStar and Ameritech (NYSE-AIT) will interconnect their networks and allow WinStar to proceed with its plans to provide competitive local telecommunications services in the Cleveland, Columbus and Milwaukee markets by year-end. WinStar has signed 35 separate interconnect agreements nationwide, including agreements with Ameritech for the states of Illinois and Michigan, as well as agreements with all the regional Bell operating companies, GTE, Sprint and Southern New England Telephone. Together, all the WinStar interconnect agreements cover 44 of the top 50 U.S. markets.

WinStar's CLEC business is based on its Wireless Fiber service, a broadband local communications service that uses WinStar's licenses in the 38 GHz band. WinStar is the largest holder of 38 GHz spectrum in the United States.

WinStar Communications, Inc. provides local telephone service to business customers nationwide as well as long distance, Internet and information services. WinStar agreed in December to pay \$22.5 million to acquire GoodNet, a national backbone operator.

CORRECTION

A Telebit in the March issue describing Information Management Systems' SiteFire web server software designed to accelerate end user web access incorrectly listed the URL for downloading the product. The correct URL is www.infoms.com/sitefire.htm. ♦



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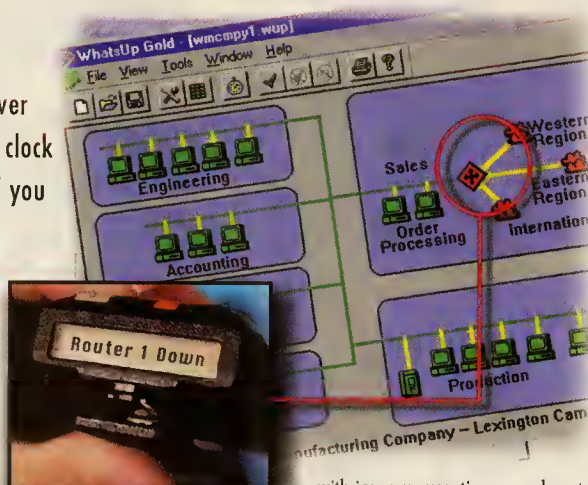


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TECHNOLOGY FRONT

by Jim Thompson
Western News Service

PALMPILOT EXTENDS THE DESKTOP TO YOUR POCKET

Personal Digital Assistants (PDAs) have come a long way since they first appeared on the scene. Lead by the Apple Newton, they were hailed as the next generation of "must have" gadgets for the techno-nerd. The shine on the Apple soon faded, however, and the taste turned sour as sales dropped off to a trickle. In late February of this year, Apple announced it was halting production of the Newton after failing to find a buyer for the money losing division. Despite this, PDAs are staging a strong comeback and they are bigger than ever. The current front runner in the revival of the PDA is the PalmPilot from 3Com. Part of the reason the PalmPilot has been successful is that it is marketed as a extension of your desktop computer rather than a miniaturized PC running a stripped-down version of a PC-style operating system. According to 3Com, the PalmPilot was engineered to "leverage the capabilities already on your desktop, without forcing you to split information between a handheld and a full-size device."

HANDHELD MANAGER

The PalmPilot allows you to manage your schedule, personal information, contacts, and e-mail all in a package that fits in the palm of your hand or in a (large) shirt pocket (4.7 inches by 3.2 inches by 0.7 inches). Place the PalmPilot into the included docking cradle and with the touch of the "HotSync" button, you can synchronize all the data in the PalmPilot with comparable applications in your desktop computer. Two versions of the PalmPilot are available, the personal edition and the professional edition. The main difference is the amount of memory for storage. The personal model has 512 KB of memory while the professional edition has 1 MB. The professional model also provides e-mail capabilities. Both are the same size and both have back-lit LCD screens. Driving the device is the Palm Operating System (Palm OS). It is based on 32-bit architecture and runs on a Motorola Dragonball 68328 processor. The Palm OS requires only about 40 KB of memory so there is plenty left for applications.

The PalmPilot includes a date book, address book, to-do list, memo pad, expense record, calculator, security, games, HotSync, and mail. Additionally, you can exchange data between the PalmPilot and many popular PIM (Personal Information Manager) software packages via plug-in software modules called conduits. PIMs currently supported by the PalmPilot include: Microsoft Outlook, Microsoft Schedule+ 7.0, Lotus

Organizer 2.1/30/97, Symantec ACT! 3.0, Now Up-To-Date, Internet Sidekick, Sidekick 97, ECCO Professional 3.03/4.0, Day-Timer Organizer 2.0, Maximizer, Franklin Ascend 97 and Goldmine. 3Com says new PIM applications are being added to the list all the time. The PalmPilot is also compatible with Windows, Windows95 and Macintosh desktop environments.

E-MAIL FUNCTIONS

Probably the main reason for the revival of the PDA and the ever increasing popularity of the PalmPilot is the addition of e-mail capabilities along with a TCP/IP stack that is built into the Palm OS. This allows applications to be added to the protocol stack by means of BSD UNIX Berkeley sockets.

The PalmPilot does not allow you to access your e-mail server directly. Instead, you link to the e-mail box through your desktop computer. Since e-mail activity is reflected on both the PalmPilot and your desktop machine, remote and on-site mail activity is kept in sync. The PalmPilot works only with MAPI and VIM e-mail clients. Applications include Microsoft Mail, Microsoft Exchange, Microsoft Outlook and Lotus Mail 2.5/6.0/7.0. POP3 Internet e-mail is handled via Microsoft Exchange. 3Com says support is also planned for Lotus Notes, Novell GroupWise and Eudora, but no release dates have been announced.

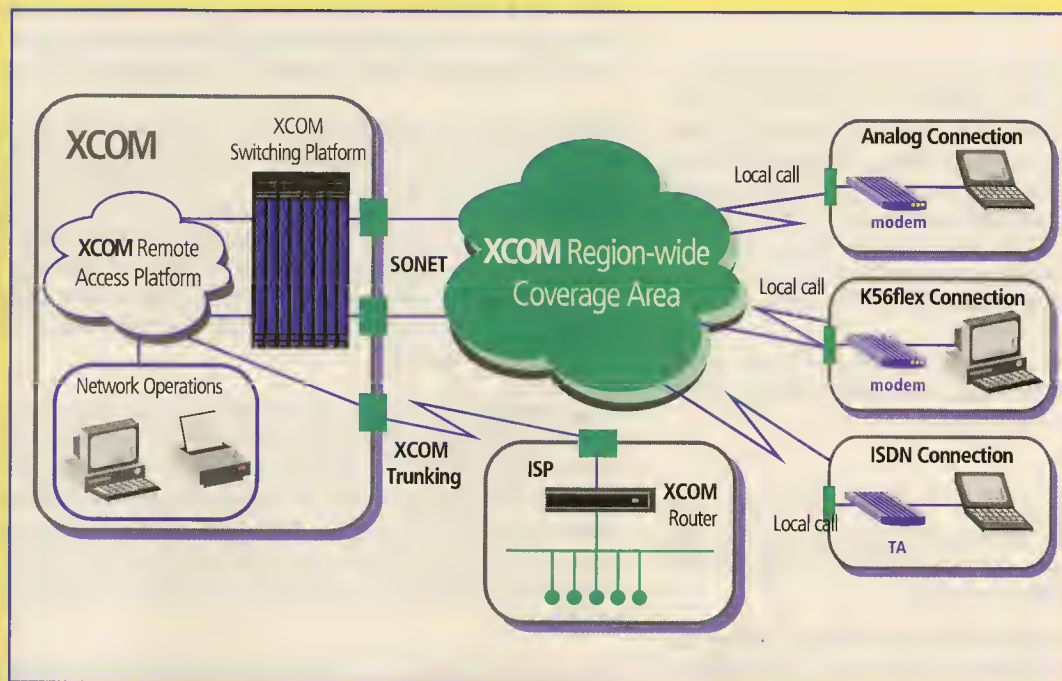
A software option called Network HotSync and an optional snap-on 14.4 Kbps modem (\$129) are also available. These additions along with the PalmPilot's TCP/IP capabilities allow you to establish network connections over WAN links and dial-up links over any TCP/IP network.

The PalmPilot also supports synchronization into remote access servers (RAS devices) from such vendors as 3Com, Ascend, Cisco, and Shiva, along with any server running Microsoft's Windows NT RAS. This network synchronizing not only will keep your e-mail in sync but also allows you to sync up databases and other PIM applications remotely. Unfortunately, e-mail functions are not available for the Macintosh.

The Network HotSync software is a sophisticated program. The challenge for the software is to find a particular PC out of potentially thousands on a network. A software package called PalmPilot Name Resolution Protocol (PNRP) accomplishes this task. (See "How Network HotSync works" for details.)

"A Price Break for ISPs"

—tele.com, January 1998



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See us at **ISPCon**, March 16 - 19, in Baltimore. Booth #255



ENTERING INFORMATION

There are three ways of entering information into the PalmPilot. You can enter data via the keyboard of your desktop computer then transfer the information via the HotSync operation; you can use the included stylus to write information using a text input system called Graffiti; or you can use the PalmPilot's on-screen keyboard. The on-screen keyboard is more of an alternative to using the Graffiti system than a real alternative to a keyboard. It works by pressing letters or numbers with the stylus.

Graffiti is a unique pen-based character recognition system. With Graffiti, you write letters/numbers in an area at the lower portion of the PalmPilot screen, which are converted to typed characters and placed into your application. There is a learning curve here. You must enter the letters and numbers in a predetermined way. 3Com says you can learn the style of writing in "less than 20 minutes" and you can "master it in about two hours." Well, maybe some people can. Frankly, I had some trouble and found entering any amount of text to be tedious.

One good thing is that you can build a custom library of frequently used blocks of text that can be inserted into an application with a few strokes of the stylus.

A WIRELESS FUTURE

Recently, 3Com announced that QUALCOMM, Inc. has licensed Palm Computing's industry-leading Palm Computing platform for integration into QUALCOMM's next-generation CDMA wireless communication products.

"QUALCOMM will use components of the Palm Computing platform to develop new wireless products that will facilitate the use of data applications, e-mail and the Internet in wireless computing environments. "The alliance extends the Palm Computing platform to the fast-growing wireless communication market..." adding wireless capability to the PalmPilot will be a significant enhancement to its capabilities. At the time of this writing, however, no date had been set for the addition of wireless capabilities to the PalmPilot. Also new for 1998 is the Palm III. This new generation device offers infrared (IR) beaming capabilities for sharing information between the portable unit and your desktop computer or with other Palm IIIs. The new unit will also have increased memory (2-MB). Additionally, it is flash upgradeable making it simple to update the Palm OS without the need to replace the memory card. With the additional memory you can store 6,000 addresses, 5 years of appointments (approximately 3,000 entries), 1,500 To Do items, 1,500 memos, and 200 e-mail messages. The Palm III will also sport a new (and reportedly more rugged) design along with a upgraded operating system (Palm OS 3.0).

At the time of this writing, the Palm III organizer was not yet available. According to 3Com, it will be out in April, 1998 for a suggested retail price of \$399.

Upgrade incentives to the new Palm III for those who own older versions of the PalmPilot are available through 3Com. Check their Web site or contact them directly for the latest offers.

CONCLUSIONS

The PalmPilot is a significant step forward in the arena of PDAs. However, its true value depends solely on individual needs. For some it will be a major part of their working lives,

for others it may have only marginal value. I found it difficult to enter text using the Graffiti function. Entering expenses for a trip on the airplane ride home took what seemed to be an endless amount of time. Once back in office, I had to link up the PalmPilot with my desktop machine to get the information in a place where it was truly useful. With practice, I would probably pick up some speed. However, I doubt if it would ever be quicker than simply entering information on a piece of paper or just waiting until I was at a proper keyboard. The PalmPilot does fit easily into the palm of your hand, but it is not what I would call small. It will go into a shirt pocket, but only with a bit of pushing. Storing it in your back pocket is not a good idea, since this is probably a very good way to break it.

Perhaps my eyes are just getting old, but I also found the screen to be hard to read under most lighting conditions. It does have a back-light and that is a help, but only in low-light conditions. In the sunlight, the screen almost completely washes out. The screen on the PalmPilot is also highly reflective making it sometimes difficult to see through the glare. With the screen off, you can easily see your own reflection. When it is on, you have to constantly move it around to keep it from reflecting light.

This problem will apparently be corrected with the release of the new Palm III. According to 3Com, "The Palm III organizer offers a variety of fonts and sizes to improve the readability of data on the Palm III organizer screen. In the desktop calendar application, the day view has been improved to provide greater access to the To Do and Address functionality, so users can easily drag and drop information from one application to the next."

The e-mail function is a significant advance for PDAs but it is also not without its limitations. First, you do have to retrieve e-mail via your office computer. This may be problematic for some. Second, setting things up for remote retrieval is not a simple process. If you are familiar with network operations or if you work in a large company and can have the network manager set everything up for you, it will be no problem. It is not, however, something for the novice to tackle. Once connected, the 14.4 modem may be a bit slow for some. Under most circumstances, this should not present any major concerns, but if you regularly receive large files attached to e-mail, it can be tiresome.

I also have some concerns about the ruggedness of the unit. I talked with numerous people who have owned a PalmPilot for more than a year. All of them reported that they had problems, primarily with the display screen if the unit is not handled carefully.

One of the users, named Sean, is a prop (property) master for films and commercials in Hollywood. He loves the PalmPilot but reports that he went through three units in the first month of use. According to Sean, "Even a slight tweaking of the unit seems to result in the screen going dead. In the course of using the PalmPilot, I inadvertently twisted it. This was not a hard twisting, and I always tried to be careful. The result was that screen died on me."

Again, 3Com has apparently addressed this problem with the new version. According to a press release, "Durability and ruggedness have been greatly increased with the Palm III organizer, while special attention has been paid to softening the edges to increase comfort in the palm of the user's hand. For extra protection, each organizer comes with a protective

35 Reasons



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flip cover. The Palm III organizer also comes equipped with an ergonomically designed metal stylus to provide a more natural fit and feel."

Despite its sensitivity, Sean loves the PalmPilot and uses it all the time. However, as noted, he does have a particular application. In his case, he needs to keep track of all the props (which could be thousands) for a film or commercial while on location. Additionally, he needs to have the telephone numbers and locations of hundreds of contacts constantly at his fingertips. His needs to retrieve information, not to enter information. For him, the PalmPilot is perfect. Your needs may be different.

I am excited about the addition of wireless capabilities and the features of the new Palm III. It also appears that 3Com has addressed most of my concerns with the new version. The added functionality of the new Palm III should make this a useful and perhaps even a "must have" device.

CONTACTS:

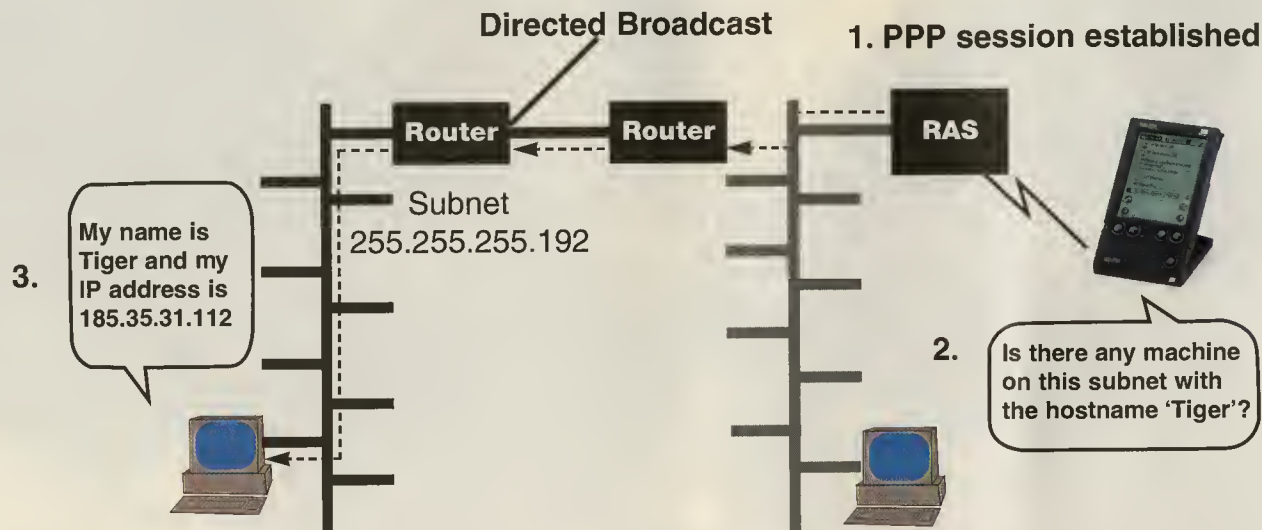
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HOW NETWORK HOTSYNC WORKS



PALMPILOT NAME RESOLUTION PROTOCOL (PNRP)

The challenge for Network HotSync is to find an individual PC out of potentially thousands of PCs on the network. The U.S. Robotics engineers solved this problem through the PalmPilot Name Resolution Protocol1 (PNRP).

Given the proliferation of TCP/IP in today's corporate networks, a simple solution to locating a PC is to store the PC's IP address on the Pilot during a "local" synchronization. This way PalmPilot can use that address to identify the target PC. PNRP will therefore always try first to contact the stored IP address during Network HotSync.

This technique is effective unless PCs are assigned IP addresses dynamically using DHCP (Dynamic Host Control Protocol) or another protocol. If DHCP is used to assign IP addresses, a PC's IP address can change at any time and is no longer a means to identify the target PC for a Network HotSync.

In case the PC's IP address has changed, Network HotSync uses the only other relevant information available: the PC's name (host name) and the address for the particular portion of the network the PC resides on (its subnet mask). Under the dial-in scenario, the PalmPilot Name Resolution Protocol works like this:

- 1) PalmPilot sets up a PPP session with remote access server.
- 2) PalmPilot sends a "directed broadcast" to the PC's subnet that essentially says: "Is there any machine on this subnet with the hostname 'Tiger'?"
- 3) If a PC is running Network HotSync and its hostname is "Tiger" it will respond: "My name is Tiger and my IP address is 185.35.31.112."

Once the PC's IP address is established, the standard HotSync process begins. Each conduit runs its course — updating calendars, address books, to do lists, expenses, e-mail, etc., until the process is complete and the TCP/IP session is closed. ♦

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ISP TECH TALK by Avi Freedman

IP SPACE UPDATE, FREE NEWS FEEDS, MORE ON NEWS, BASIC IP FILTERING

Avi Freedman started Net Access, the Philadelphia area's original ISP, in October of 1992. Net Access is currently a regional ISP, with and more than 200 downstream Internet providers and dedicated-line customers, and thousands of dial-up and web-hosting customers. Net Access services Boston, New York, Philadelphia, Baltimore, DC, Chicago, and San Francisco.

Avi has been very active on the inet-access mailing list and is a vocal proponent of the continued viability of startup and existing ISPs. He is also on the ISP/C Board as Director at Large and the ARIN Advisory Council. ISPs can join inet-access by e-mail to inet-access-request@earth.com. SUBSCRIBE in the subject. Avi can also be reached at freedman@netaxs.com or <http://www.netaxs.com>.

I'm going to try to get this column in Boardwatch regularly from now on; I apologize to those who have been left hanging on BGP and Cisco configuration issues. If you have questions about anything, feel free to ask on the inet-access mailing list (see <http://www.amazon.com/internet> for the FAQ and subscription info), though.

Also, thanks to all who came by our booth at ISPCON for newsread.com. I'm sorry if we were out of T-shirts. Our "My ISP sucks less" T-shirts were the hit T-shirt of the show, apparently, and we blasted through two batches of T-shirts (500 in all) in 4 hours on the first day and 4 hours on the last day. Anyone who signs up for a newsread.com trial gets one now, or if you really wanted one, just send us money for shipping and we'll send you one (see <http://www.newsread.com> for details). Of course, the back says "with newsread.com" - the T-shirt is a promotion, of course.

Also, we've printed up some hats that were pretty popular. The three Cisco-related ones were "conf t", "write erase"; and "sho ip bgp". We'll try to have pictures of them up on the ispsat web page (URL below) for those interested in wearing "Cisco Chic."

IP SPACE UPDATE

Good news, ISPs:

The new ARIN rules have kicked in. It is now MUCH easier to get your own address space than ever before. It'll cost you \$2,500 to do so, but the benefits are well worth it.

Why is it important to have your own address space? Well, if you are using address space that's part of a larger "aggregate" block (we went over this a year ago in this column), some parts of the Internet won't see a "smaller" announcement unless it's at least of size /19 - a /19 is 32 contiguous Class C-sized blocks.

So if you announced a /22 that you had from provider A to provider B, and your connection to provider A went down, some parts of the Internet (say, Sprint and DIGEX) won't hear that /22 announced from provider B. In fact, they never hear that /22, even from provider A - it's just that since that /22 is part of a /16 or so (a Class B-sized block or larger), the packets from Sprint and DIGEX find their way to your network based on that larger "aggregate" route.

So what are the new rules? If you have *well-utilized* a /21 of space, you can get a /20 allocated to you, and announce it as a /19. A /21 is 8 contiguous /24s (a /24 is the CIDR notation for a Class C-sized block); a /20 is 16 contiguous /24s; and a /19 is the magic 32 contiguous /24s that "bypass" the route filters imposed by the some, such as Sprint and DIGEX. You'll have to agree to renumber your old space quickly into the new space.

What does "well-utilized" mean? It means, roughly speaking, that you've:

- sub-netted and sub-allocated your address space efficiently (thus, only giving people the address space they need, + or - 16 or 32 addresses); and
- have filed SWIPs (this process was covered by a previous column as well) in a timely fashion, informing the ARIN (and the world), who you've allocated or assigned that IP space to. See www.arin.net for more info about filing SWIPs.

As a rough rule, being able to ping 50 to 70 percent of your address space is a pretty good sign. You DO need to file SWIPs

for "subnet" allocations (allocations of less than 256 IP addresses), and you do NOT need to file SWIPs for "internal use" allocations - you just need to keep track of them and submit a list of how you're using space internally with your application for new IP space.

This is very good news for the ISP community - many ISPs will become eligible for their own IP space at



Avi Freedman stands on Tel Inc's new extruded aluminum cased CSU/DSUs.

Photo by John Fellers

ISPs Foil Experts' Prediction of DOOM!

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least a year or so before they would have under the old rules, which will cut down on the heartache of renumbering all of your IPs if you have to switch providers

FREE NEWS FEEDS

We at Net Access are embarking on a new project, isp-sat (<http://www.isp-sat.com>). We're offering free 2-4 Mbps news feeds to any ISP east of the Rockies - all that ISPs have to pay is the one-time setup cost. We're also offering a free 6-month trial of web cache pre-population feeds (throwing HTTP objects into your local cache boxes in an attempt to have your cache boxes pull less terrestrial bandwidth), and the ability to back up your Internet connections via a combination of ISDN dial-out and Satellite return path. All of the details are on the web site.

We've already had this cut into our newsread.com business, but that's a risk we take... This will work with any non-"sucking" news server you have locally.

MORE ON NEWS

More good news:

(As it were.) Highwind.com has finally finished their news reading software, a mate for their industrial-strength (pardons, DIGEX) news transfer software called Cyclone. Their new reader products are called Typhoon (priced at \$3k) and Breeze priced at \$5k. They are designed to run under Solaris. Though there's a Linux port, it doesn't really work (they claim there are some issues about whether Linux really works, but that's another issue). Breeze and Typhoon have the same core, but Typhoon allows you to simulate multiple virtual news servers on one machine (to offer a newsread.com-type service). The software and docs are available for demo at <http://www.highwind.com>.

Typhoon (I'll refer to both as Typhoon from now on) stores articles and overviews very intelligently (cyclically on disk, actually), and has the same intelligent object caching engine that Cyclone has, but tuned for news reading rather than feeding. Typhoon can support about 4,000 simultaneous news readers on a high-end multi-processor Solaris box; on a base Ultra one can expect one reader per 256k of memory, or 1,000-2,000 simultaneous news readers per 512mb Ultra 1/170. We're just testing the software now, but hope to report shortly on in-the-field results.

newsread.com has two news reading boxes now - one is a Sparc 10 with a Sun "Model 81" CPU - 85mhz, 1mb cache; 256mb of ram; and 10 disks. It runs a modified INN 1.4unoff4 build with security and some performance patches, but it has a load of 2 when just receiving a full feed.

In comparison, a Sparc 10 with a base Model 41 CPU (40mhz, 1mb cache) and 8 disks can receive a full feed with a load average of less than .25 - due entirely to the more efficient news storage on disk.

There are other (mostly free) news reading products that'll be available soon (from the diablo and nntprelay crowds), and there's one that's been out for over six months from the cyclic-inn development team/worker - though that's not really ready for novice use. The diablo work looks interesting and follows a more distributed/caching model, with the concept of "header-only feeds", but if you want to reduce News to almost no work at all, I strongly encourage you to grab an evaluation copy of

Typhoon or Breeze and play. Your disks will kiss you for it. (Cyclic storage means much less disk seeking. You'll hardly know the news box is alive.)

If you're interested in following the developments of the new news reading software packages, subscribe to the news.software.nntp group - but please, read the archives and follow the group for a bit before posting, as it's important to keep the signal-to-noise ratio good on that group.

BASIC IP FILTERING

Most of you are probably running unsafe networks. Unsafe for you and unsafe for the Internet community. What defines safe? Letting in only those packets that you should (that's "safe for you"), and sending out only those packets that you should (that's "safe for the community").

What kind of packets should you accept? Only packets destined to your own IP blocks, and only packets with source addresses outside your IP blocks. Why? There's never a time that you want to accept a packet from the outside world that says it came from inside your network. (Unless you're connecting multiple POPs via the Internet, which is a pretty bad idea. In which case your filtering job is much harder. Please consult an expert.)

What kind of packets should you send out? Only packets with source addresses inside your network. Why? If you send a packet out with a source address of www.whitehouse.gov, it's a pain in the ass for someone out on the Net to try to track down and when they do track it down they're going to be unhappy with you for allowing a "bogon packet" out of your network.

How do these packets with bogus source IPs get created? Well, long ago on a Net far away, all boxes connected and speaking IP were pretty expensive and were run by "professional" or at least "knowledgeable" sysadmins. However, on today's Net, every hacker d00d with a Linux box has root access on his own machine, and can generate any sort of nasty packet they want and send it down their dial-up SLIP or PPP line and into your network.

With the well-known (by now) smurf attack, they can send one little packet with the source address of some other ISP's terminal server port (typically they'll do this because of some little baby fight on some little baby hacker d00dz IRC channel). Anyway, they'll send a packet with a bogus source address to the broadcast address of a huge network. On an improperly configured network, this'll cause tens or hundreds of ping-responses to go flooding at the IP of some other ISP's terminal server port - all because you let that bogon packet get out.

As a network provider, we at netaxs.com have clocked over 200 Mbps of extra inbound traffic to our network at the peak of a smurf attack. All of that traffic was destined to one IP on a terminal server on a 56K customer of one of our T-1 customers. Not fun. So be a good Net citizen and filter crud from exiting your network.

HOW TO DO IP FILTERING

Step 1:

Gather thy routes. Get a list of all of the IP addresses you use inside your network. A good starting point is "sho ip route" on your Internet-looking router. Let's say you gather:

207.106.20.0/24 (/24 = a mask of 255.255.255.0)
207.106.50.0/23 (/23 = a mask of 255.255.254.0)
207.106.96.0/22 (/22 = a mask of 255.255.252.0)

Now, you need to create your inbound and outbound filters.

Step 2:

Type "sho ip access" (from here on in we assume you have a Cisco router - if you don't, please buy one). Make sure you have no access-lists numbered 110 and 111. If you do, use different numbers as you follow along below.

A note: Cisco ip access-lists have the format:

```
ip access-list NNN [permit|deny] ip SOURCE DEST
```

The [permit|deny] means that you can put permit or deny at that point in the line.

SOURCE and DEST can both be any of:

"host a.b.c.d"; "a.b.c.d m.n.q.0" (an ip and a netmask, describing an IP block, as we do below); or "any".

access-lists start with access-list 1 and go to at least 199 on most Cisco routers.

Step 3:

The inbound list.

We want to permit all packets unless they have a source address inside one of our routes. For the routes above, the list will be:

```
ip access-list 110 deny ip 207.106.20.0 0.0.0.255 any ip access-  
list 110 deny ip 207.106.50.0 0.0.1.255 any ip access-list 110  
deny ip 207.106.96.0 0.0.3.255 any ip access-list 110 permit ip  
any any
```

So, what did we do?

Well, first, notice the "0.0.0.255"; "0.0.1.255"; and "0.0.2.255". Those are what Cisco calls "inverse masks," which are used in describing "ip" filter lists, both "packet filters" like we're creating here and "route filters" like we'll go over in a column shortly. To compute them, take the "netmask" and subtract it from 255.255.255.0. So, notice for the three routes that 255.255.255.255-255.255.255.0 = 0.0.0.255; 255.255.255.255-255.254.0 = 0.0.1.255; etc.

Then, some more details: By making the "ip access-list"s have numbers above 100, when you type "sho ip access 110" you'll get packet counts at the end of each line showing you how many times each line was hit. You'll probably be surprised at the results.

With the list above, *the first three lines should get NO hits* Why? Because they say "for packets going through this list, don't allow any packets that say they came from 207.106.20/24, 207.106.50/23, or 207.106.96/22." The fourth line says "permit any other packets." Since you should never get any packets from the outside that say they came from the inside, you should never get any hits on the first three lines. But you probably will. Sigh.

Step 4:

The outbound list.

We want to permit all packets unless they have a source address NOT inside one of our routes. For the routes above, the list will be:

```
ip access-list 111 permit ip 207.106.20.0 0.0.0.255 any ip  
access-list 111 permit ip 207.106.50.0 0.0.1.255 any ip access-  
list 111 permit ip 207.106.96.0 0.0.3.255 any ip access-list 111  
deny ip any any  
So, what did we do?
```

We permit any packets that have a source address within one of our network blocks. We deny all other packets. Again, you should see no "hits" on the fourth line of the access-list 111, but you probably will

Step 5:

Apply the lists to interfaces.

Do a 'sho conf' and make sure that on your external interfaces, you have no existing access-lists ('ip access-group NNN [in|out]'). If you do, consult with the person who put them there...

If not, identify the serial (or other) interfaces you use to talk to your provider. If you talk to your provider via ethernet, ignore this column; you need more advanced lists. You CAN-NOT put these lists on your internal ethernet interfaces or you will kill your network traffic.

But, let's say that you have on upstream link out Serial0.

You'd enable and type 'conf term'; then enter:

```
int Serial0 ip access 110 in ip access 111 out end
```

You'd do the same thing for Serial1 if you were using that to talk to an upstream provider.

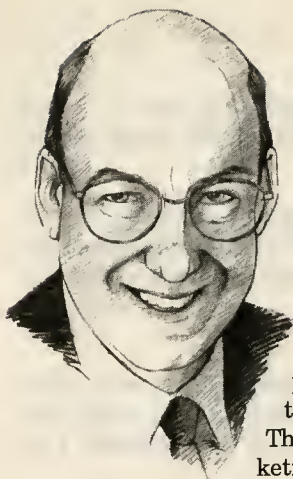
Then, you can type 'sho ip access-list' or 'sho ip access-list 110' or 'sho ip access-list 111' to see how many 'hits' you get on each line of each access list.

If you have any questions before implementing this, I'd encourage you to ask on the inet-access list so others can learn from the answers.

Note:

We'll talk in the future about other things you'll want to put into your inbound and outbound filters (things like rejecting RPC, X windows, and other kinds of traffic), but these filters are a good first start.

Thanks for being a safe net citizen. ♦



MARKETING 101 for ISPs

by Michael Greenbaum

PRESENTING THE BILL

Michael Greenbaum is vice president of sales and marketing at AppliedTheory. He previously held senior management positions in the software, Internet, online services and hardware industries. At Borland International he was vice president of marketing responsible for all marketing and public relations functions including the annual user's conference. As a vice president at Bell Atlantic Internet, he was responsible for that company's strategy to develop an Internet presence and later to be an Internet service provider in its service area. Prior to that, he was general manager of Prodigy Services Co., the pioneering online service and was instrumental in applying the ease-of-use characteristics of the consumer to business applications. His business experience began in sales, marketing and business development with IBM.

Internet service is technology, but in this age of exploding growth and intense competition, technology providers must market themselves as adeptly as they deliver service. This column applies the basic principles of marketing to the needs of ISPs. Our mission is to bring you practical techniques, proven to work in this specialized arena, and to explain them for those with a background in technology, not marketing.

GREAT MOMENTS IN SERVICE: PRESENTING THE BILL

Many years ago, a drug company ran a series of illustrated ads entitled "Great Moments in Medicine," to which Mad Magazine added its own great moment: "Presenting the Bill" (the bed-ridden patient swoons). Like problem calls, which we discussed last month, your bill presents another opportunity to take a negative moment and turn it positive. Whether you bill by mail or electronically, this may be your only regular opportunity to communicate with most of your customers.

The bill provides two kinds of communications opportunities:

- One is the billing statement itself. This should be simple, painless, used to communicate benefits, not just costs, and looked on as a medium to highlight non-billing-related messages.
- The other is collateral information, whether inserts in a mailing, or additional links in a web billing area. This is prime real estate for your most important messages. It is mail that actually gets opened, or one of the few areas on your site customers are likely to visit regularly.

Although how you exploit these opportunities will vary depending on whether you do paper or electronic billing, and on the nature and your relationship with your customer base, the basic principles are nearly universal.

A core idea to apply here (and throughout your business) is "one-to-one marketing." As described in an excellent book by that name by Peppers and Rogers, the idea is that you need not chase *share of market* if you can gain *share of customer*.

Instead of trying to get a narrow slice of revenue from many customers, you can try to get a broader slice of revenue from fewer, good customers. This is the key opportunity for small and medium-sized ISPs who may lack economies of scale, but can exploit economies of scope, based on knowing their customers, and serving their unique needs better than any competitor can.

STRATEGY AND TACTICS

Communicate benefits. Look for ways to accentuate the positive. If users are on a discount plan, tell them how much they saved. If your base rates are discounted, consider comparison to a benchmark competitor, just as long-distance companies show savings over AT&T. If you are reporting web activity, play up customer hits or visits as a benefit, not a cost.

Make it informative. Present useful information in an interesting (even entertaining) way. Customers will be more willing to read your messages if you give them information they can use. Historical usage reports are an ideal opportunity to make your bills valuable to decision makers, so they do not just pass them on to accounts payable with barely a glance. Include useful service messages and helpful hints.

Invite dialog. Always strive to avoid one-way communications. Monologue wastes the opportunity to engage your customers, and risks turning them off by seeming out of touch and uncaring. Encourage user feedback on what they like and what they don't like, as well as suggestions for improvements. No matter how skilled you are, you can't fix the problems you don't know about. Also invite other forms of contact; for example (as suggested in an earlier column), if you are exhibiting at a trade show, you can mention that and invite customers to stop by. (The broad objective of building effective dialog is a critical task that will be the subject of a future column.)

Customize. Do as much as you reasonably can to customize the messages in your billings. You know your customers, and much of what you know is reflected in billing-related data. That data tells you what services they use now, how much they use, and offers clues as to what else they need. Think not in terms of billing systems, but of customer information systems. You already know geography and size (at least in the form of usage), and can add SIC industry codes, and other background information.

Cross-sell and sell-up. You can exploit your knowledge of the customer in the billing process by cross-selling services. Customers of access service may be candidates for security services, web hosting or VPNs. You can also view this as an opportunity to sell-up. For access and hosting customers, you can tell if they are nearing a usage level that warrants more capacity. Let them see this well in advance so they can plan and budget for upgrades, and highlight the message when it is time to get serious. Use this mechanism to alert your sales force, also!

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Build your brand. Keep branding in mind in presenting your bill and related messages. Branding is the idea that all your communications should focus on establishing and maintaining a clear and simple image of who you are in the mind of the customer, both at the level of corporate identity, and at the level of specific products or services. When a customer thinks of you they should think of a few attributes, perhaps some (but only a few) of the following: quality, dependability, teamwork, reliability, depth, economy, expertise, state-of-the-art, ease-of-use, speed, etc. No matter what else you do, be sure your billings reinforce that image, rather than sloppy, careless, low-budget, dumb, infuriating, etc. (Branding is a major topic that will be the subject of a future column.)

Consider co-op ads. Carrying ads for related services by other companies can be a win-win situation for you, your infrastructure partners, and your customers. Non-competitive, but related services like modems or web designing might be candidates. The caveat is to be sure your customers will view this as a service, not as spam.

Exploit the benefits of hard-copy mail. There is a strong temptation to

use electronic billing to reduce costs, especially for consumer and small-business services. In making this decision, be sure to factor in the value a mailing can provide in maintaining strong customer communications. It is much less likely that e-mail messages will be seen than paper-in-hand (envelopes with bills do get opened). On the other hand, in large companies, the bills may go to someone other than the decision maker. In that case, or if you do electronic billing, consider sending a separate "service summary" (perhaps quarterly) to help stay top-of-mind with your real customer. You can build this into a value-added service for capacity and expense planning, much like the quarterly expense summaries provided with the American Express corporate card.

Make electronic bills part of a positive service area. Recognize that the billing area is logically part of a customer service area, and present it that way. On the billing pages, include links or banners to tie in positive messages. Again, think about one-to-one marketing; it is particularly relevant to electronic marketing and the creation of value-added, customized pages and content.

Keep it simple. (Remember the basics #1:) Don't make it painful to try to read

the bill. Avoid unnecessary detail, or summarize first, then list detail in a separate section. Learn from long-distance companies and other marketing-oriented companies that depend on their monthly bills. Use good typography and layout design to highlight important items and keep details in the background. The direct mail marketers have made a science of this.

Exploit white space and envelope capacity. (Remember the basics #2:) Be efficient about maximizing the messages you can carry without overloading the reader. Use the bill statement itself to billboard important news, like service upgrades or new services. Add bill inserts to make the most of your mailing investment. Think like the credit card companies that decide which inserts to put into each envelope based on the weight of each invoice, so each envelope can carry the maximum without bumping to a higher postage level.

The key idea is to always look upon your bill as one more opportunity to relate to your customers in a positive way. We have tried to present some basic suggestions on how to do this. No doubt you can find many more if you try.

USEFUL RESOURCES FOR MORE INFORMATION

There are not a lot of Web resources I have found on this specific topic, but here are some that could be helpful:

- Direct Marketing Resources - an organization aimed at the direct marketing industry, has general information on techniques and other resources.
<http://www.direct-marketing.org>

- Top Marketing Tips, Tricks & Techniques, courtesy of Disclosure, Inc. - a major database vendor, has some good advice on marketing techniques.
<http://www.disclosure.com/marketing/toptricks.html>

More on call centers: Here is one more resource related to last month's column:

- The Customer Care Institute (CCI) - an international organization serving customer care professionals, provides information, research, advisory services, benchmarking, training and networking opportunities, including an online forum which is fairly active.
<http://www.customercare.com> ♦

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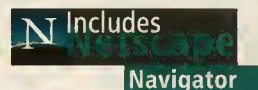
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POLICY FORUM

Rudolph Geist

MOVE OVER MICROSOFT — NETSCAPE'S WITHOLDING PRE-PAID NAVIGATOR LICENSE FEES FROM ISPs — ENGAGING IN QUESTIONABLE PRACTICES OF ITS OWN

Rudolph J. Geist is a telecommunications attorney with the Washington, DC firm of Wilkes, Artis, Hedrick & Lane specializing in and helping to develop the area of Internet law. Mr. Geist represents ISPs in numerous matters before the FCC and state regulating bodies, including relations with other telecommunications providers, carrier certification, consultation regarding federal grant programs, federal, state and local taxation issues, First Amendment issues, domain name and IP address allocation issues, and mergers and acquisitions.

He also serves as counsel to the United States Internet Providers Association (USIPA), a national trade association established to facilitate fair government and telecommunications industry policies for ISPs. Mr. Geist can be contacted via e-mail at rgeist@wahlone.com, telephone at (202) 457-7345, or through USIPA's World Wide Web site at www.usipa.org.

Netscape Corporation's January 22, 1998, decision to provide unlimited distribution of its Navigator software occurred as a result of intense competitive pressures from its chief rival in the browser market, Microsoft Corporation, which has historically distributed Internet Explorer for free. While Netscape's decision may ultimately help the company's competitive position vis-à-vis Microsoft, it has resulted in Netscape engaging in some questionable practices of its own with respect to its ISP partners. Specifically, since it announced its decision to provide unlimited distribution of Navigator software, Netscape has sought to sidestep its obligation to refund pre-payment amounts paid to Netscape by its ISP partners as down payments on Navigator licenses. The amount of these withheld pre-paid license fees could amount in the tens of millions of dollars across the entire ISP industry.

Prior to its decision to give Navigator software away for free, Netscape typically required its ISP partners to enter into a software licensing agreement entirely on Netscape's terms and conditions. The only terms which were negotiable in these licensing agreements were the contract duration, total license copy commitment, and price per copy. To enter into an agreement with Netscape, the ISP partner usually would also be required to pay a substantial pre-payment on the license fees of at least \$10,000, or one-third of the total license fees for the total license copy commitment, whichever was greater. For example, if an ISP believed it would need 10,000 copies of Navigator over a one-year term, the ISP would negotiate a price per copy for the projected 10,000 copies, and would be required to pay approximately one-third of the total cost for the licenses as an up-front pre-payment. Pre-payments could range anywhere from the minimum of \$10,000 to up to several hundred thousand dollars.

There are likely hundreds, and even thousands, of Netscape ISP partners in the United States who have executed similar licensing agreements, and who have made substantial pre-payments against which Netscape is supposed to offset charges for copies of its Navigator software. Now that Netscape is distributing its Navigator software for free worldwide, it appears to be taking the position that any ISP who made a pre-payment to pay for copies of the software is not eligible to get the unpaid portion of the pre-payment refunded.

However, Netscape's decision to give Navigator software away for free equates into a unilateral alter-

ation of the conditions of its standard licensing agreement to the detriment of its ISP partners. The old requirement to make substantial pre-payments for copies of Navigator software, now free, does not entitle Netscape to simply keep the pre-payments. Netscape has made no attempt to provide refunds to these ISPs.

Netscape's licensing agreements do typically contain a provision stating that the pre-payment is non-refundable. Although these provisions are ambiguous, they theoretically should only be enforceable so long as the software licensing agreement is still fully effective. Here the software licensing agreements are no longer effective as a result of Netscape's unilateral modification of the agreement by giving the Navigator software away for free. This unilateral modification should effectively extinguish the non-refundable pre-payment provision from application to the pre-payment amount. In entering into these software licensing agreements, the parties intended that the pre-payment was to be used to pay for Navigator software licenses. Now that Netscape no longer charges ISPs for Navigator software, the pre-payment can no longer be applicable - and should be refunded. Any other result would be unjust enrichment to Netscape and flat-out inequitable.

ISPs who have contacted Netscape with concerns and requests for refund of their pre-payment money have been told by Netscape that the company will provide no refunds, but will essentially give the concerned ISP "store credit" on other Netscape products. Specifically, instead of a cash refund, until June 30, 1998, Netscape is offering ISPs its Communicator Pro Edition and ISP Hosting software at substantial discounts, all of which Netscape proposes to offset against the concerned ISP's pre-payment.

These alternatives are unacceptable. Netscape cannot withhold cash pre-payments upon unilaterally modifying an agreement and then offer only merchandise credit on products not contemplated for purchase under the agreement. Most ISPs entering into software licensing agreements with Netscape did not bargain for these other products and may have no desire to purchase these products, but rather bargained for and entered into an agreement to buy copies of Navigator. These ISPs should be entitled to a refund and not merchandise credit on unwanted products.

Netscape has also created a corporate and bureaucratic maze through which ISPs must navigate to even attempt to raise their concerns over the with-

holding of their outstanding pre-payment amounts. One ISP, US Netway, Inc., (which also happens to be owned by the columnist's brother) was forced to spend more than two months navigating through Netscape Corporation's bureaucratic nightmare, placing dozens of unreturned telephone calls, leaving numerous unreturned voice mail messages, and engaging in discussions with more than ten people in several different departments inside and outside Netscape (none of whom appeared to know anything except that US Netway should be speaking to another person at Netscape). Netscape finally put the ISP in touch with a person who was knowledgeable about the issue and who was in a position to discuss a potential settlement. However, US Netway's plight ultimately resulted in a decision by Netscape to offer the ISP only what had been offered two months earlier (despite the long process of "navigating" through the corporate and bureaucratic maze) - store credit on other Netscape products.

What should an ISP do if they have executed a similar software licensing agreement with Netscape and feel that Netscape is unfairly withholding their pre-payment? First, the ISP may attempt to contact Netscape and negoti-

ate a settlement to obtain reimbursement of its pre-payment. If negotiations fail, the ISP may consider filing a lawsuit against Netscape. In its cause of action, the ISP might consider claims of unilateral modification, breach of contract, unjust enrichment and any other legal remedies that may apply.

If your ISP is one of the many who made a pre-payment to Netscape for the purchase of Navigator software licenses, you should pay careful attention to this issue. Netscape may also be attempting to withhold your pre-payment. ♦

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Hummer



Photos by John H Fellers



Temporarily speechless — Hummer winner Chris Candreva, (right) chats with Jack Rickard (left), in the back of the ISPCON Spring '98 Humvee.

By Bill McCarthy

Just prior to driving to ISPCON in Baltimore from Rye, New York, Chris Candreva had electrical problems in his 1987 Chevrolet Caprice. He worried if the car would get him and his employee to the convention and back. On the way home he had no problems. He drove a brand new Hummer.

"You could knock me over with a feather," Candreva said.

"I drive a 1987 Chevy Caprice and traffic acts different around me, and I can't imagine what it will be like driving this thing," he said, on the show floor of ISPCON Spring '98 minutes after being selected as the winner. There's probably a good reason why traffic acts different around Candreva who says of the Caprice: "I love that car. It still does 110."

Candreva started his Internet services business in August 1994 when he could not find a decent ISP - one that did not crash within minutes of logging on. Within six months the company's growth began to snowball. He now has about 1,000 customers in the Westchester County area - the suburbs of New York City.

"I started with an overgrown BBS on a Sun Sparc II and five phone lines," Candreva said. Along with his mother Lillian Candreva, who is also a programmer, Chris started the ISP in the

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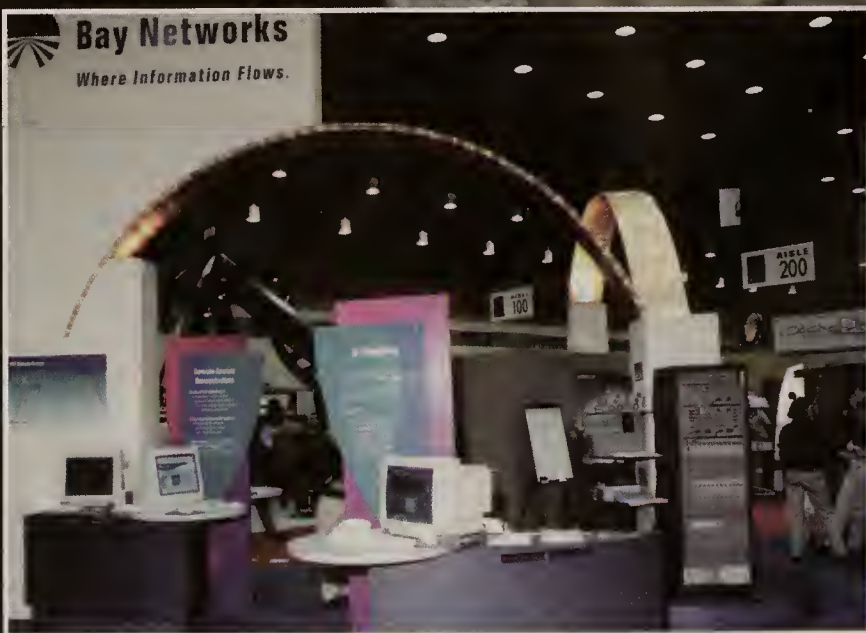
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TUESDAY, MARCH 17

TUESDAY, MARCH 17

ISPCON Spring '98 Session Index (back), Sponsors & Author Geoffrey Moore — Counterclockwise (left-to-right): Boardwatch, Bay Networks, 3Com, Moore, IBM, Nortel, Compaq and Digital



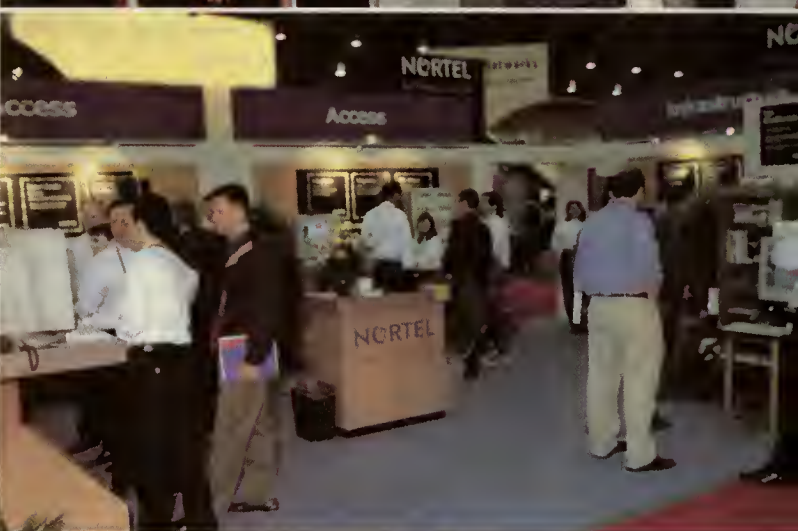


TUESDAY, MARCH 17

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basement of his parents' house. That basement is still the heart of the business, although the 28-year-old Candreva has since married and moved out of the house and is looking for office space for the growing business.

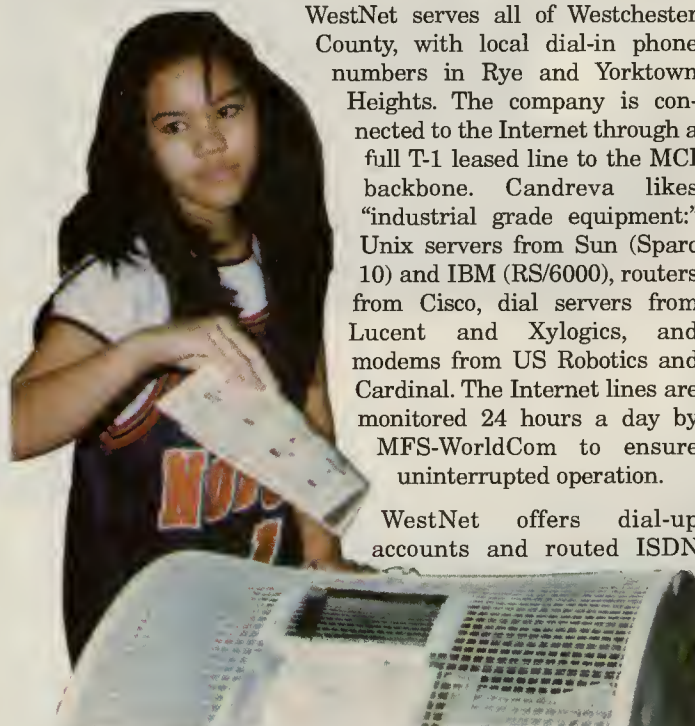
Christopher X. Candreva is the president, the owner and operator of WestNet. He plays guitar, reads Science Fiction, and programs for a living. He drives a 1997 four-passenger, open-top Hummer with an off-white exterior, a 6.5-liter, eight-cylinder, GM turbo diesel with fully automatic four-speed transmission valued at \$74,082, at least for the moment. Candreva, a graduate of Stevens Institute of Technology with a BA and MS, may be selling the Hummer at some point. Rye, New York, may be a bit urban for such a ride.

"I'll probably end up selling it," Candreva said. Although he wants to keep the Hummer, "It's a little bigger than my needs." His mother and grandmother wanted a ride, but they needed a stool to get in. While he needs a second car, his wife is unable to drive either the Caprice or the Hummer, and it barely fits in his parents' garage. "It's so big, I can't even lean over and kiss my wife" when he picks her up from work.

The vehicle has brought Candreva and WestNet a fair amount of attention, however, which never hurts an ISP in a competitive environment. "Lots of people know about it. I've heard some discussion and some interest," he said.

WestNet serves all of Westchester County, with local dial-in phone numbers in Rye and Yorktown Heights. The company is connected to the Internet through a full T-1 leased line to the MCI backbone. Candreva likes "industrial grade equipment." Unix servers from Sun (Sparc 10) and IBM (RS/6000), routers from Cisco, dial servers from Lucent and Xylogics, and modems from US Robotics and Cardinal. The Internet lines are monitored 24 hours a day by MFS-WorldCom to ensure uninterrupted operation.

WestNet offers dial-up accounts and routed ISDN



And the Winner is . . . Jennifer Rickard, (Jack's daughter) pulls the winning entry



Hummer Hopefuls — ISPCON attendees gather for the Hummer drawing

connections, which Candreva said has caught on with many of his customers. He's seen few of the problems getting the lines he needs from Bell Atlantic that other ISPs around the country have experienced with local RBOCs. WestNet supports modem speeds up to 56 Kbps, using the Rockwell/Lucent K56flex standard, and will support the new ITU V.90 standard. WestNet also offers a full range of web hosting services, including domain registration, a virtual mall called the WestNet Mall, and virtual servers. The company offers its customers additional services, such as Clari-Net for breaking news from around the world, Usenet, and Newsstand.

Out of the millions of dollars in business transacted on the show floor, the 270 educational sessions, Candreva said the thing he found most valuable was mingling with the 4,374 attendees, most of whom were other ISPs. "It's great to talk to other people out there who are actually doing the same things," Candreva said. "You realize you're not out there all alone, and not everyone is just out to get you. Some of the sessions are very helpful. The vendor floor is just overwhelming."

Candreva said, for example, that he came away with some new ideas on leasing equipment. It's one thing to learn about new hardware, software, marketing management in the sessions, he said but it's even more valuable to talk to ISPs that are actually implementing the new ideas.

Other ISPs said the same thing; it's the intermingling that counts and is the most helpful. John Stottlemire, president and CEO of Digital Express Internet Services in Marianna, Florida said, "It is my opinion that conventions such as ISPCON are very much (a) need of every Internet provider. The information which was openly shared between ISPs as well as the information obtained from the vendors who attended is priceless. Being able to come to a centrally located site and obtain the information which was made available cuts time we will have to spend trying to obtain the same information through other resources, the World Wide Web, direct mail advertising, news groups and, yes, even spam."

But Stottlemire wants even more formal interaction among ISPs. "One small detail which I do think needs improvement:

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It is fine for vendors and 'experts' in different fields to tell us what we need to do to become successful, however, I hope that at some point in the future we will have some emphasis in speaking with other ISPs in an 'open forum' who may enlighten us as to how they became successful so that we may take back with us the tried and true practices which are successful," Stottlemire said. Currently the ISPs meet anywhere an everywhere in haphazard fashion, on the floor, outside the sessions and at the evening parties and dinners.

There were problems with the registration process, which hopefully will be ironed out before the September 28-October 1 ISPCON Fall '98 in San Jose.

Most of the vendors seemed satisfied as well. Peter Gitlin, director of business development for Hall-Mark Computer Products, said: "Having just returned from ISPCON in Baltimore, I feel compelled to offer you some observations about what was for us a truly outstanding conference. Hall-Mark Computer Products partnered with Digital to offer a Solution Providers VAR program to the ISPs, but frankly we were unsure of the response that we would receive from the attendees. The message we intended to deliver was that the ISP community must move quickly in offering value-added services to their enterprise customers, and that Hall-Mark and Digital were prepared with the programs and products that offered the ISPs their best opportunity to move forward towards this goal. We were overwhelmed with the positive response we received. The level of engagements on the show floor, in the seminars, and in private one-on-one meetings was the best of any show we have attended. We truly believe that

the ISP community has a tremendous opportunity to expand their business into higher and higher levels of the enterprise, and are thrilled to see that the show attendees not only feel the same way, but are eager to implement quickly."

"Our theme at the show was 'Managing the Web-Year'...and combining Hall-Mark's world-class reseller program with Digital's 64-bit Alpha NT and UNIX, plus storage and networking solutions, offer the ISP a framework for managing their business amidst constant change. The ISP community is poised to 'cross the chasm,' as Geoffrey Moore so elegantly stated in his session. Hall-Mark and Digital are engaged to support that leap."

You can still catch Geoffrey Moore's marketing lectures, even if you missed the show. They are available on the Compaq web site at <http://www.events.audionet.com/events/compaq/>. Other Compaq speakers sessions are also available.

Moore, author of *Crossing the Chasm* and *Inside the Tornado*. Moore, a marketing authority in the high technology world, began his sessions during a lunch sponsored by Compaq Computer Corporation, and followed lunch with a half-day session designed specifically for Internet service providers. ♦

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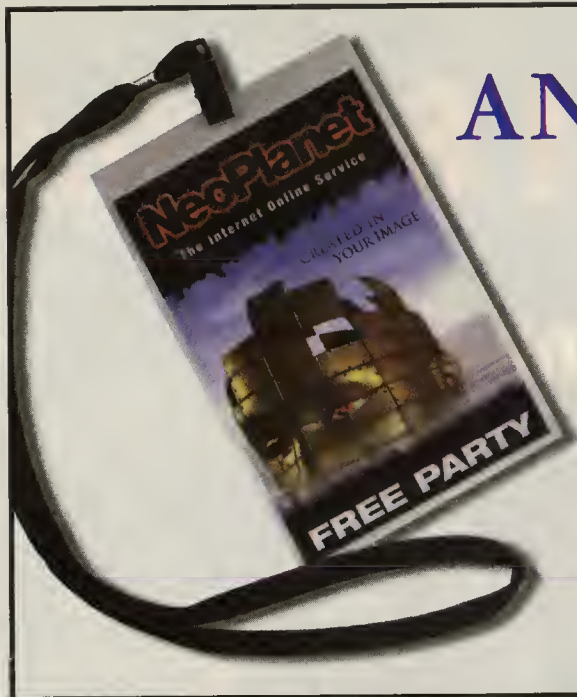
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ANNOUNCEMENTS FROM ISPCON

Numerous vendors and ISPs made major announcements of partnerships or new products during ISPCON Spring '98. Here are a few of the announcements.

BIGFOOT LAUNCHES NEOPLANET ISP PROGRAM, PREVIEWS VERSION 2.0

Amid tanks filled with stingrays and sharks, waiters serving drinks and hors d'oeuvre like coconut shrimp at Baltimore's National Aquarium, BigFoot announced a user interface designed to allow ISPs to compete with AOL for newbies to the Internet.

The company launched both NeoPlanet 1.0 and the "NeoPlanet ISP Partnership Program" at a great party that had the aquarium open to ISPCON attendees. NeoPlanet is a user-friendly web browsing interface with an intuitive point-and-click channel bar and built-in directory to 800 commonly used web sites. Designed for ISP branding and distribution, the program offers a simple browsing interface for non-technical users.

Bigfoot also previewed NeoPlanet 2.0 at the convention to demonstrate upcoming features in its next-generation product. Version 2.0 will present Internet access providers with a complete "online service in a box," that incorporates e-mail, chat, instant-messaging and web browsing into a single user-friendly online environment.

NeoPlanet uses Microsoft's web browsing technology that is embedded in the operating system to present web pages within its alternative UI. NeoPlanet integrates a web directory and popular Internet tools into the browsing interface. NeoPlanet is available to be branded and packaged by ISPs and content providers who can initiate sign-up at www.neoplanet.com/isp.

MEDIAGATE DEBUTS EDGE COMMANDER

MediaGate Inc. announced its Edge Commander Universal Edge Server, a hardware remote access server that can process e-mail, pager, fax and voice messages into a single mailbox using the company's integrated iPost Universal Messaging software. The Edge Commander with iPost starts at \$19,995 for a 24 port server.

ALTEON AND INKTOMI TEAM TO DELIVER CACHING

Inktomi Corp. and Alteon Networks announced a strategic alliance under which they will develop a transparent network caching system intended to improve performance of the World Wide Web.

The companies will deliver to ISPs and Internet backbone providers worldwide a distributed caching product that automatically and transparently directs web traffic to high-performance cache servers. The companies say that using this software and hardware, ISPs can dramatically improve user response times and reduce wide area network bandwidth costs by up to 25 percent or more with minimum configuration and administration requirements. The combined Inktomi/Alteon Networks system will scale to transparently support millions of simultaneous users.

The combined system consists of Inktomi's Traffic Server network cache and Alteon Networks' new ACEdirector server load-balancing switch. The companies have completed interoperability testing and the product is immediately available. Inktomi and Alteon Networks are also cooperating on the development of protocols to enhance the way caches are integrated into large networks. These features include the ability to redirect web traffic to remote cache sites anywhere in the network, along with the ability to offload processing-intensive network functions from the cache servers. The companies will sell each other's products to provide a single source for ISPs that can be easily deployed with minimum administration.

NOVELL UNVEILS PARTNER PROGRAM

Novell unveiled a new partner program, Novell Internet Enhanced Service Provider for ISPs, to foster the ISPs' use of the Novell Directory Service (NDS).

Central to the products will be Novell's NDS, the directory platform. Novell currently has about 79 million NetWare seats, of which 33 million are running NDS-enabled versions of NetWare. Along with its directory, network management

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and groupware products, Novell plans to offer ISPs caching products for speeding the delivery of static web pages from web servers to large numbers of attached clients.

The ISP program is available immediately through Novell to ISPs and Novell's existing channel partners.

SAVVIS AND MIRROR IMAGE ANNOUNCE PARTNERSHIP

Mirror Image Internet Inc. announced a partnership with national backbone operator SAVVIS Communications to market its centralized caching network and management service to SAVVIS customers in Chicago, St. Louis and Dallas areas. Mirror Image launched its Cache Management Service at the show as well. The company says its caching network and management service uses a process it calls Active File Verification to ensure that cached files are not discarded prematurely and the outdated files are not retained. The company's servers which are located at major Internet exchange points around the world will provide corporations and ISPs a secondary caching service that works with existing caching and proxy servers. The company said it deployed the product in more than 10 countries including Australia, Great Britain and Sweden.

GRIC SIGNS UP JAPANESE ISP

GRIC, an international Internet roaming access service formerly known as AimQuest, announced that Japanese ISP Fujitsu/Niftyserve joined its consortium of more than 260

worldwide ISPs. The deal give Fujitsu/Niftyserve's 3 million users access to GRIC's service

COPPER MOUNTAIN, NETOPIA TO DELIVER DSL PRODUCTS

Copper Mountain Networks, a developer of DSL products announced a partnership with Internet software company Netopia, Inc. in which the two companies will jointly develop and market a line of DSL Internet connectivity product for businesses. The first product the Netopia SDSL LAN modem is available for a list price of \$695.

RMI TO GROW WITH PARTNERS

Rocky Mountain Internet announced partnerships with PSINet and Seattle telecom provider PacNet. RMI said it will offer business Internet services through PSINet's 235 points of presence and the UniSpan Network in which PacNet participates.

FONEFRIEND RELEASES PRODUCT

FoneFriend Inc. introduced its new Internet telephony products, system and a service known as a FoneFriend. FoneFriends Systems charges 10 cents per completed call and voice messaging is free. The product plugs in like an answering machine or modem and needs a standard 12-button touch tone telephone, an analog telephone service and Internet access from any ISP who uses PPP to access the Internet. The basic plan calls for \$99 down and \$19 a month for two years and 10 cents per completed call.♦

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ISPs AGREE ON LITTLE, BUT THEY DON'T WANT THE GOVERNMENT TO CHOOSE THEIR PEERS

By Bill McCarthy



Photo by John Fellers

**PSINet founder, Bill Schrader talks to
Boardwatch's Bill McCarthy at ISPCON Spring '98**

What frightens PSINet founder Bill Schrader more than a united MCI and WorldCom to compete with for Internet customers: government regulation.

Because of that the founder, CEO and president of PSINet is supporting the MCI-WorldCom merger, but when he said that at a seminar on peering at ISPCON'98 in Baltimore, it seemed to stun the audience. Some ISPs are concerned that proposed \$37 billion merger would mean that the new behemoth could control peering to the extent that competitors could be excluded.

Schrader has been out in front on the issue of peering, and made quite a bit of commotion with it at the ISPCON '97 in September. In the wake of an announcement by UUNET Technologies, WorldCom's subsidiary, that it would charge smaller ISPs to peer, Schrader said PSINet would provide "free peering" to all comers, in the interest of the overall health of the Internet.

Using information gathered by *Boardwatch Magazine*, concerning the number of Internet connections that ISPs have to backbones, the combined companies would carry more than 50 percent of all Internet traffic. Some ISPs fear that would enable MCI-WorldCom to control the cost of access to the Internet and the terms for peering. WorldCom maintains that the combined revenues of the UUNET and MCI Internet backbones would account for 20 percent of the market and would pose no anti-competitive threat.

This discussion about who connects to whom became hotter in the wake of the U.S. Department of Justice's investigation into the proposed merger of WorldCom Inc., of Jackson, Mississippi, and MCI Communications Corp., of Washington, DC, and how it affects peering seemed to be of little concern until recently.

WorldCom executives said in May they intended to charge small ISPs for connections to its backbone, and many ISPs are concerned that MCI-WorldCom could potentially degrade some smaller ISP connections, thereby giving customers incentive to switch from smaller carriers to MCI WorldCom. The Justice Department is trying to evaluate what a com-

bined MCI-WorldCom's market share would be and its effect on the Internet.

But even if MCI-WorldCom does end up controlling the majority of Internet traffic, that does not necessarily mean that it would be to the Internet's detriment, said Farooq Hussain, a Washington, DC, specialist on peering and an MCI consultant. Companies spend "tens of million of dollars" to build global and national networks and they "just can't see it as a wash" to allow smaller networks to peer without paying.

There have been opportunities given the scope of a global network for companies such as MCI and WorldCom to exploit their current situations and they have not, Hussain said. There is no reason to believe that the companies will act differently in the future, especially since it is in their self-interest to cooperate. Still many are concerned in light of WorldCom subsidiary UUNET Technologies' aborted attempt to enforce new peering rules last summer.

Hussain said, "The peering agreements are not a barrier to entry into the industry." Settlements are "a terribly complicated rat hole" and the potential problems that arise from it could ultimately bring about government regulation, "which is the last thing we want."

On this Schrader agrees. "I don't support any government regulation, none whatsoever," Schrader said. "Even if that were the only way to get free peering I wouldn't support it. The goal is right, but the process is wrong."

Schrader said: "I think the business is so open and unpredictable" that there are opportunities for any number of players even if a MCI-WorldCom giant emerges. "Do I respect their power? Absolutely," Schrader said. But companies of that size are looking to be all things to all customers in the communications industry, and Schrader said that leaves opportunities for companies like PSINet to concentrate on running the best data network and providing other specialties.

He remains concerned about peering based on UUNET's May announcement, however. Schrader responded at ISPCON '97 in September with an announcement that PSINet supported



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"free" peering to all ISPs that were capable of collocating with PSINet equipment. ISPs that want to transit the PSINet network and access other networks that are connected to PSI will still have to pay transit fees of \$2,500 a month. But the political vision of Schrader of the Internet is clearly different than that of UUNET, at least in the eyes of the small ISPs who spoke to *Boardwatch*.

There is a fine distinction between paying for transit across the PSINet backbone and paying to peer with UUNET. The only other way to reach another ISP's subscribers would be through public peering network-access points, through private peering or by buying a connection to the targeted ISP.

Historically, large and small providers exchanged traffic with each other for free at public network access points (NAPs) without tracking whose network carried a bigger load. All providers have been free to choose whom they would or would not peer with. That simple, unwritten cooperative agreement is what makes an Internet with, at least in theory global connectivity, but it has been under stress because the biggest ISPs began exchanging traffic directly with backbone providers of similar size at private peering points to avoid traffic loads at the NAPs and to the exclusion of smaller ISPs.

UUNET announced in May that ISPs that did not meet its peering criteria would have to pay transit fees to have UUNET deliver their packets. MCI and Sprint made similar announcements, and smaller ISPs naturally felt threatened.

The tracking and measuring of usage is also a very complicated issue. Known as settlements because the ISPs involved settle on a rate for carrying someone else's traffic, there is no fixed value on either end. Carriers justifiably seek returns on their investment and implementing more sophisticated settlement techniques appears to be one road to that end. But it appears to be a complicated and dangerous road.

Cole Libby, PSINet director of network operations, said: "Settlements are principally driven by one side pays and one side doesn't. It's not clear that the side that pays receives the most value."

Ivan Kotcher, analyst at Dimension Enterprises, a Herndon, Virginia, consulting firm, said, "Some sites are more important than others." Determining who derives the most value from an Internet connection is not as simple as determining who initiated a telephone call because of the content that is accessed. Peering agreements traditionally are made with contracts that contain nondisclosure clauses, Kotcher said, so it's difficult to even assess who is paying whom currently.

Schrader and Libby stressed that their concept of "free peering" for ISPs of all sizes has advantages for all parties concerned. Free peering allows for an open communications system. It allows broad access and it's in PSINet's self-interest because it encourages the growth of the overall Internet and provides more value to its existing customers as well as an attraction for new customers. Smaller ISPs benefit by connecting to PSI, but the initiative also brings greater value to PSINet's customers since they have a more direct connection to the customers of PSINet's ISP partners.

Schrader says there is no pressure to join PSI as a customer: "We'll just do free peering with you and call it quits." But ISPs satisfied with their peering arrangements are potential transit customers and may come to PSINet when they need other services.

Schrader said with new OC-48 capacity coming online this year, the company has the bandwidth to make its peering initiative possible. In a deal announced in July valued at \$240 million, PSINet gave 20 percent of its equity to IXC Communications. In exchange, PSINet will receive 10,000 miles of OC-48 backbone. That amounts to 50 times its current capacity.

John Curran, chief technical officer of GTE Internetworking, agrees that there is a problem determining who should pay whom in "settlements" of peering agreements. Who receives the most benefit the company selling something on a web site or the person looking for that product across another network. "We don't have a good model" for who should pay for transit, he said, and transit is the same as settlements. Currently, the consumer pays but at a flat rate and that model does not work very well, he said.

GTE believes that the key for determining who is a customer and who is a peer must be kept to simple criteria, Curran said. "Anybody who meets the criteria, we will peer with," he said. The system is simply a check off on a list so that a clerk can determine whether an ISP is eligible. "You make it or you don't," and the criteria does not change based on who applies. "A club for backbone providers" needs to be avoided, he said.

Curran said that although "I despise their very existence" NAPs are important because they are an entry point for all players. But players still need to be selective about peers. These checks are needed, he said, so that "no random dial-up customer can announce routes" that will bring down the system, a vulnerability that is very real if thousands of BGP programmers and thousands of routers on the system can announce routes at critical peering points.

SAVVIS Communications Chief Technology Officer Mike Gaddis said: "No one should expect to connect in one place and have a connection to your backbone." On the other hand, he said, the idea that "if you ever bought transit from me, I'll never peer with you" is destructive to the overall wellbeing of the Internet. Peering should be open to everyone and those who peer could be matched according to the size of their networks or their customer bases or based on some other objective criteria. (See Gaddis' white paper on the subject in this issue.)

John Kraft, vice president with PSINet's carrier and ISP services, said, the big guys set the rules and set the rates. "In the meantime it's all about money. It's all about profitability and you should do the things that help your business over the next year or two."

Phil Lawlor, president and CEO of AGIS, said: "We want to charge as little as we can, and we don't want to move more packets than necessary." If smaller ISPs and backbones would be more willing to peer with each other it would help keep the costs down and the amount of traffic spread and bring the Internet closer to the "world without limits" that the end users envision when they sign up for an Internet account.

The Internet is a very competitive business, yet it takes a tremendous amount of cooperation or it fails to exist. As the Justice Department investigates the MCI-WorldCom deal for its affects on competition, rumors say the DOJ has kicked around a number of ideas including having WorldCom set UUNET free or force all ISPs to allow free peering. At ISP-CON in Baltimore the issue received full discussion in a number of sessions, yet the ISPs involved could come to no conclusions except one: Talk of any type of government intervention, from the Justice Department or the Federal Communications Commission, scares everyone in the game. ♦



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ISP TECH TALK by Avi Freedman

SATELLITE-BASED BANDWIDTH AUGMENTATION

EDITOR'S NOTE: This is a continuation of Avi Freedman's April column.

Avi Freedman started Net Access, the Philadelphia area's original ISP, in October of 1992. Net Access is currently a regional ISP, with and more than 200 downstream Internet providers and dedicated-line customers, and thousands of dial-up and web-hosting customers. Net Access services Boston, New York, Philadelphia, Baltimore, DC, Chicago, and San Francisco.

Avi has been very active on the inet-access mailing list and is a vocal proponent of the continued viability of startup and existing ISPs. He is also on the ISP/C Board as Director at Large and the ARIN Advisory Council. ISPs can join inet-access by e-mail to inet-access-request@earth.com SUBSCRIBE in the subject. Avi can also be reached at freedman@netaxs.com or <http://www.netaxs.com>.

Since most of inbound content is probably porn, I suppose you could call it breast augmentation and not be far off. Anyway, two of our T-3 customers practice it. Basically, in Europe and Australia, most ISPs get in 3-10 times as much data as they push out. And they pay between \$10,000 and \$40,000 per Mbps of bandwidth! "Satellite Half-duplex Bandwidth Augmentation" is the practice of taking satellite time (which is cheaper than transoceanic fiber) and sending data from the U.S. to the foreign ISPs, one direction. Because the data is only flowing to those ISPs via satellite, the overall round-trip time (latency) isn't too terrible.

TYPICAL ISP BANDWIDTH USE WHERE BANDWIDTH IS EXPENSIVE

Putting web farms where bandwidth is expensive is not a swift idea. So we're going to assume for this discussion that that web sites are presented off in (optionally replicated) web farms somewhere.

Now, if your bandwidth is expensive because of high local-loop costs through Billy Bob's telco in the U.S., or because of both transoceanic pipe cost and governmental extortion (ah, tariffs) in European and Asian countries, you're typically going to host content somewhere cheap, like the U.S., if you find your outbound bandwidth use creeping up.

But your core functionality, providing mail, news reading, and web browsing to dial-up and corporate customers — primarily the web browsing part — involves taking much more data than you send.

For each web request, you send out maybe 80-200 characters and can get back 1K, or more typically 10K or 100K! This is a huge inbound:outbound ratio.

So, let's say you're caching already, but you still need about 2 Mbps of inbound-from-the-Internet bandwidth. One approach is to get a 2 Mbps pipe to a local or national provider, costing anywhere from \$5,000 (if you're in the boonies in the U.S.) to \$20,000 to \$80,000 or more outside of the U.S.

Or you can get a dial-up ISDN line or two, or a usage-based T-1 or E-1, to a provider and contract for \$10,000 to \$40,000/mo satellite inbound bandwidth. Your outbound data flows over your terrestrial pipe, and so does some of your inbound data.

But your satellite-bandwidth provider tries to be your "best path," and advertises your routes in the U.S., then aggregates traffic destined for you with traffic destined for other ISPs and sends it up to a satellite, usually in 8 Mbps "streams."

The receive-only gear costs us\$10k or so, give or take, plus cabling costs. And you need a router that can receive an 8 Mbps data stream, which isn't cheap.

There are various ways of encoding those streams, ranging from Frame Relay to IP tunneling. And you have to be sure your provider isn't overselling capacity (or, at least, that you always have the bandwidth you're contracting for available to you).

But that's the basic idea.

I hope to have a powerpoint presentation available soon with a network architecture for OGN's (an Australian provider-to-providers) delivery of half-duplex satellite-delivery bandwidth augmentation available in a few months.

WHAT ABOUT LATENCY?

Geosynchronous satellites are way out there. Tens of thousands of miles out. It takes a long time, relatively speaking, to get data out to them and back. Each "hop" is about 120-150 ms, including equipment latency. So, to send data from the U.S. to Australia or Europe via satellite takes 300ms (150ms up and 150ms down). Then, to send it back over fiber or copper takes 100-150ms. The total is 400ms or so on average.

In a "full-duplex" satellite application, the basic latency is 600ms (150ms up and 150ms down, then on the return path 150ms up and 150ms down).

It turns out that 400ms as a total round-trip time is a lot better for TCP utilization and perceived throughput than 600ms.

Also, 400ms with almost-zero packet loss is a few thousand percent better than 80ms with even 5-10 percent packet loss, even for interactive applications!

WHAT ABOUT SECURITY?

So what about security? If the packets are uplinked to the satellite as raw IP out of a router speaking HDLC, PPP, or Frame, any standard router can receive the IP data stream.

POP quiz

PSINet is:

- a) A wholesale provider of Internet private-label and services for ISPs
- b) The only national Tier 1 backbone network offering free peering to ISPs
- c) Now offering economical transit services
- d) Offering 100 days of free access for 100 accounts*
- e) All of the above**

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IS THIS REALLY A PROBLEM?

Well, if they are stupid, they'll flood their Ethernet and upstream connections of they monitor your bandwidth (if they transfer the packets from the serial port of a router to their Ethernet).

Even if they're smart, they're still seeing only one part of the communication — the inbound. So it's hard(er) to capture passwords and e-mail by sniffing, but still possible.

The larger problem is that someone could send packets into a data stream and then listen for those packets, thus stealing valuable bandwidth.

Two easy approaches are available, neither of them cheap.

(1) Get a compression card, and compress the data. (2) Get an encryption card, and encrypt the data.

In either case, it'll be hard to unpack by a thief.

Surprisingly, most satellite IP links to Australia, Asia, and Europe run unencrypted.

WHO DOES IT?

There are now others getting into the business, but (conflict of interest warning) two of our customers were early pioneers, which is how we gained knowledge and experience with the market.

Netsat, <http://internetsat.net>, serves primarily European ISPs, and actually does bidirectional satellite transit for many in addition to bandwidth augmentation. NetSat has

most customer ISPs receive the data streams themselves, and shapes/guarantees inbound traffic with Frame Relay switches.

Ourworld Global Network (OGN), <http://ogn.net>, in Australia has a slightly different model. They receive the (currently) 8 MB data streams at their core POPs in Sydney and Melbourne, and redistribute to customers terrestrially, usually with PAPL (basically, the Australian version of DSL over alarm circuits) 2 MB links in each city.

Both companies have almost entirely ISPs as customers, and don't cater to the business marketplace currently.

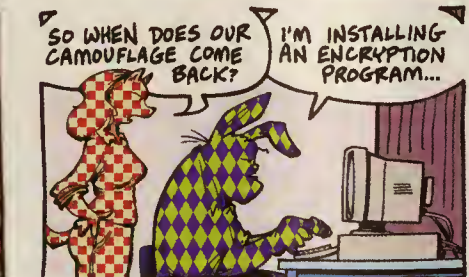
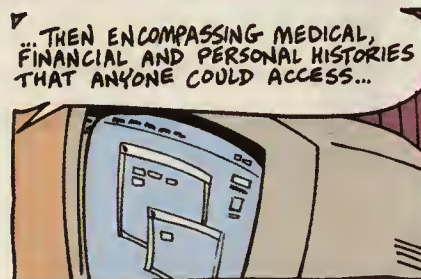
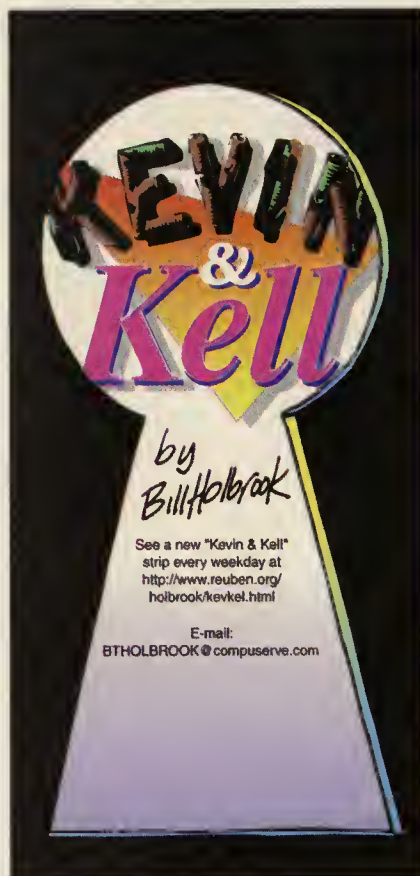
TECHNICAL TRICKINESS IN THE LAND OF EXPENSIVE BANDWIDTH

I actually had a bit of fun setting up the OGN network for satellite bandwidth augmentation. In fact, the whole Australian ISP economics make for interesting technical 'necessities', including caching, reverse caching, and other various hackeries.

It's tricky to get half-duplex links to come up, and even trickier to make them stop being used when they're down. Some ugly static routes and IP tunnels allow routing information to flow only when the satellite connections are up, and weighting the routes heard via various IP tunnels allow for dynamic rerouting to a different city when rain fade hits one city hard.

Also, it's cheaper to advertise your routes to Telstra, the dominant Australian carrier, in the U.S. and then beam it back over satellite — but that screws up Quake users pretty badly.

Anyway, sometimes U.S. routing gets "boring," so working with these customers keeps us on our toes...◆



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—Roger Gallego



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Durant Imboden is a freelance writer whose credentials include published novels and nonfiction, fiction editing and staff writing for *Playboy*, travel writing for corporate clients, and representing authors at a New York literary agency. He currently manages the Writing Forum on The Microsoft Network and co-authors the "Flame Wars" column on Delphi, where he is an editorial consultant. Durant maintains a web site for writers at <http://www.writing.org>.
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PUTTING THE NET TO WORK by Durant Imboden

MACROMEDIA DREAMWEAVER

WYSIWYG web authoring tools have been around for three or four years, or nearly as long as HTML editors. One of the earliest was Internet Assistant, an add-in for Microsoft Word. FrontPage and Adobe PageMill expanded on the word-processing model; then came NetObjects Fusion, a DTP-style program that generated HTML files in much the same way as PageMaker or QuarkXPress generated PostScript files.

Such applications continue to be popular with writers, do-it-yourself webmasters, and designers who want to create web pages without the time-consuming drudgery of HTML coding.

Full-time studio Web designers have been reluctant to adopt WYSIWYG authoring tools for two reasons:

Professional pride. There's a common perception that "pros code by hand." (Mind you, the only people who care about this are the HTML programmers themselves, and they aren't paying the bills.)

Corporate standards. Many studios and clients expect pages to be coded in a certain way for ease of editing in a collaborative environment. WYSIWYG tools, like FrontPage and NetObjects Fusion, generate code that can be difficult or nearly impossible to modify by hand, and this shortcoming may negate any productivity benefits that such tools offer.

ENTER MACROMEDIA DREAMWEAVER

In 1997, Macromedia looked at the web design industry and saw an opportunity. On the one hand, hand coding of HTML files no longer made economic sense—at least, not for high-volume page production. And on the other hand, existing WYSIWYG authoring tools were unacceptable to many professional designers.

Macromedia decided to chart a new course by developing a tool that would (1) generate code behind the scenes like other WYSIWYG tools, (2) allow "roundtrip" importing and exporting of HTML code, and (3) be compatible with existing HTML or text editors such as HotDog Pro, HomeSite, BBEdit, and Notepad. The result was Dreamweaver for Windows 95/NT or Macintosh (<http://www.macromedia.com/software/dreamweaver>).

Other reviewers tended to focus on Dreamweaver's support of Dynamic HTML (DHTML) and Cascading Style Sheets (CSS), which give the program a leg up



on FrontPage 98, NetObjects Fusion 2.0, and other WYSIWYG tools, in the "Who's Got the Coolest Features" trophy contest.

But let's be realistic: Most computer users are still using Generation 3.0 or even 2.0 browsers, which means that timelines, behaviors, and other leading-edge Dreamweaver features are likely to be wasted on a large portion of the Web audience. For the professional web designer, Dreamweaver's "roundtrip HTML" and clean code generation are likely to be the most compelling reason to spend hundreds of dollars on the program.

NOT JUST WYSIWYG, BUT ALSO WYWIWYG

Other WYSIWYG authoring tools allow you to set user preferences, but none can match Dreamweaver's Burger King or "Have it your way" approach to HTML coding. Dreamweaver's Preferences dialogue has a "Source Format" tab that lets you determine what to indent (and by how much), whether to autowrap text (and at what column), what case to use for tags and attributes, whether to convert tags and attributes in imported code, and so on.

Want to customize your settings even further? Open the SourceFormat.profile text file in the Configuration subdirectory, and you can change the default indents, line breaks, etc. for specific tags.

For example, I like having paragraphs indented and double-spaced in the source code to make them stand out from the clutter of an HTML file. By changing the `<p>` tag's default `<p break=1,1,1,1>` setting to `<p break=1,1,1,2>`, I get paragraphs that display optimally when I view the source code in an HTML editor, text editor, or browser.

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If I were ambitious, and designed web sites for half a dozen clients, I could create a SourceFormat.profile file to match each customer's HTML style guide. (I'd have to copy the appropriate file into the Configuration directory each time I started working on a different client's pages, but that's a minor annoyance that with luck may be corrected in future versions of Dreamweaver.)

By now, you're probably wondering if Dreamweaver can clean up badly formatted HTML code that was written by another WYSIWYG application or a sloppy human programmer. The answer, unfortunately, is "No"—but that would be a great feature for a future release!

WHAT DREAMWEAVER IS AND ISN'T

Unlike FrontPage and NetObjects, Dreamweaver doesn't pretend to be an all-in-one web creation and management package. Rather, it's a WYSIWYG editor that takes a "page-centric" approach, leaving webmasters to handle their files and links with third-party, site-management software.

To facilitate collaboration, Dreamweaver has a library feature for sharing common elements, and it lets the designer check in and check out files from a remote server. However, it doesn't perform "versioning," which means the webmaster is responsible for deleting unneeded HTML files, .gifs, .jpegs, etc. on the server, when content is revised.

Let's take a brief look at how you build a site in Dreamweaver:

The first step is to create a root directory on your hard disk. (No, you can't do this within Dreamweaver.) For example, the root directory for a Doughnuts Web site might be "donuts."

Next, you use the "Site" dialogue to create a new site in that root directory and make any new folders you'll need—e.g., subdirectories for "images," "sounds," and perhaps HTML files under secondary topics like "yeast-raised," "cake," and "crullers."

You'll also want to enter FTP values under the site's properties if you intend to move files to and from a remote server.

Now you can start building your pages. This is much like working in a word processor. You create pages, type text, insert images, make tables, and so on. Each element, such as a highlighted block of text or a table, can have its attributes set with a "Property inspector" dialogue that floats on the desktop and changes as you move from one element to the next. (Some elements permit hands-on editing. Table cells, for instance, can be made wider or narrower by clicking and dragging the vertical dividers.)

Dreamweaver has one feature that's especially handy: When you import an image, a sound, etc. from an external source (such as another directory on your hard drive), Dreamweaver prompts you to save the file within the site. This helps you avoid links that point to file locations on your hard disk (a mistake that I've made all too often with other WYSIWYG tools).

FREE BONUS GIFT!

The philosophy behind Dreamweaver seems to be, "Keep professional designers happy at all costs." This means catering to the customer's preferences and recognizing that old habits die hard.

With this philosophy in mind, the Macromedia team didn't bother to create an internal HTML editor like the one in FrontPage 98. Instead, they made it possible to launch any third-party HTML or text editor from within Dreamweaver, so that a designer could stick with familiar tools.

They also included a bonus gift: Allaire HomeSite 3.0 with Dreamweaver for Windows, or BBEdit 4.5 with the Macintosh version. Since HomeSite is widely regarded as one of the best Windows HTML editors and BBEdit is a standard among Mac web designers, it's hard to look these two gift horses in the mouth. (Unfortunately, there doesn't seem to be any mention of this in the documentation, and the Dreamweaver setup program doesn't ask if you'd like to install the bundled HTML editor. This isn't a fatal oversight, but it seems a little sloppy in a package that lists for \$499.)

GLITZ AND GLITTER

I've already said that Dynamic HTML and CSS are of limited usefulness at this stage of web development. By the time most Web surfers are using generation 4.0 browsers, new releases of Dreamweaver, FrontPage, and NetObjects will be on the market—a fact that makes the inclusion of DHTML and CSS features in Dreamweaver 1.0 less exciting than Macromedia's brochures and PR hype might suggest.

Still, if you want to wow the rubes with animated layers and the like, Dreamweaver can help you do it without becoming a JavaScript guru. For example:

1) Want a logo or photo that zips across the page before coming to a stop in a selected location? Easy. Click "Insert layer," drag an image into the layer, then use the floating Macromedia Directory-style "Timeline" window to choose options such as the start and finish points, animation speed, and cycle or autoplay. Dreamweaver automatically generates the Javascript to get the job done.

2) Need a "behavior" such as a mouseover action? You can attach a behavior to just about anything in Dreamweaver, using the "Behavior Inspector" window. For example: On your Simpson's page, you select a photo of Barney and assign a WAV sound to onMouseOver. When users open the page, they'll get a Barney-style "buuuuuurp" every time they move the cursor over Barney and his mug of beer. Or, if you prefer, you can have the Behavior dialogue change a property, launch a timeline, or do something else when the specified user action takes place.

To save you from your own cleverness (or the program's), Dreamweaver includes a "target-browser check" that examines your page for compatibility with the leading web browsers. If a page element (such as the EMBED tag) isn't supported, Dreamweaver's onscreen report will show the incompatible browser and the offending code.

ABOUT THE INTERFACE

Dreamweaver's main editing window is clean, empty, and free of distractions. Icons, palettes, and specialized functions are handled in floating windows that can be turned on or off at will. And for an extra trace of elegance, the most commonly used window — the Property Inspector — reinvents itself whenever a new item is highlighted. (Move the cursor from a block of text to a table, for example, and the Property Inspector's table dialogue appears.)



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The bad news is that Dreamweaver's floating windows can quickly clutter up your screen, even at 1280 x 1024 on a 20" monitor. I'd like the program better if it had an optional full-screen background where the palettes and dialogues could be anchored in position instead of piling up like the handwritten notes on my kitchen refrigerator.

DREAMWEAVER: IS IT FOR YOU?

If you're looking for a self-contained package for building web sites, Dreamweaver isn't your best choice. You'll be happier with FrontPage 98 (bugs and all) or NetObjects Fusion, which may be available in a 3.0 version by the time you read this.

But if you're in the market for a WYSIWYG authoring tool that won't screw up your code and integrates smoothly with existing HTML editors, Dreamweaver is the only game in town. The Dynamic HTML and CSS features are added niceties, but Dreamweaver's real strengths are the control and peace of mind it gives the designer. It's an impressive accomplishment—especially for a 1.0 release!

Do you have an Internet-related product, service, or success story that might be appropriate for *Boardwatch Magazine's* "Putting the Net to Work" column? If so, <mailto:imboden@writing.org>.



macromedia
DREAMWEAVER

A COMPETITIVE COMPARISON

So how does Dreamweaver stack up against FrontPage 98 and NetObjects Fusion? Let's take a look:

DREAMWEAVER

Pros:

- Clean code
- "Roundtrip HTML"
- Easy to edit finished code, using the bundled HTML editor or any other text editor
- Dynamic HTML and stylesheet support across multiple browsers
- Advanced control over user preferences (such as the format of HTML code)

Cons:

- ❖ Minimal site-management features
- ❖ HTML editor is a separate program, requiring the user to learn two applications
- ❖ Few templates
- ❖ No database features



- Templates and Wizards
- Database features

Cons:

- ❖ Ugly, hard-to-edit HTML code
- ❖ Modifies imported code
- ❖ Annoying bugs that require constant alertness by the user (see last month's column)

NETOBJECTS FUSION 2.0

Pros:

- All-in-one program
- DTP-style layout precision, with the ability to draw frames for text, images, etc. anywhere on the page
- Excellent site management
- Automatic simultaneous publication of leading-edge, low-graphics, and no-graphics versions if desired
- Templates and site styles
- Database features

Cons:

- ❖ Published HTML pages are complex and difficult to edit
- ❖ File sizes tend to be large
- ❖ Does a poor job of importing existing pages
- ❖ HTML files must be generated each time pages are changed, adding an extra step to the editing process

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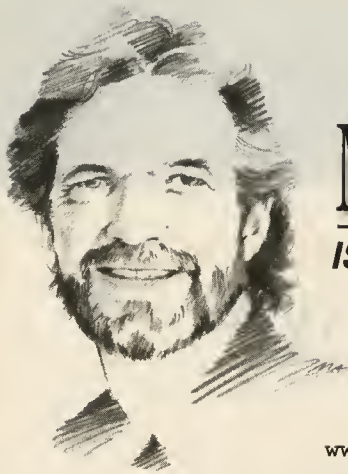
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MANNING THE WIRES

by Ric Manning

IS YOUR PRIVACY POLICY SHOWING?

Many of the nation's biggest web sites are sporting new links and buttons that point to the site's policy on user privacy. *The New York Times* (<http://www.nyt.com>), *USA TODAY* (<http://www.usatoday.com>) and *Disney.com* (<http://www.disney.com>) are among the web sites that now prominently display links to the site's Terms of Service statements and privacy policies.

In many cases, the links were added after the Federal Trade Commission announced in February that it would examine 1,200 commercial web sites to find out if they disclose how a user's personal information is collected and used. In particular, the FTC wants to see if consumers are given a choice as to how their information will be used.

The results of the survey will be delivered to Congress this summer, which is considering almost 100 new bills involving the Internet.

A recent Dilbert cartoon illustrates the challenge of preserving personal privacy in the Electronic Age. A group of people in a restaurant are discussing the dangers of shopping on the Internet while they blithely hand over their credit cards to the waitress.

When the waitress returns in the next panel, she's wearing a fur coat.

Some of the same people, who say they would never buy anything online, for fear having their credit compromised, wouldn't hesitate to read their account number over the telephone or send it through the mail. They also are likely to be unaware of just how much personal information an Internet web site can capture and share with others without ever getting near your credit card.

WHO COLLECTS PRIVATE INFO?

It's not unusual for large web sites to collect information about your habits and interests just by tracking what you do when you visit their sites. And most won't tell you what they are doing or how you can be excluded. When the Federal Trade Commission reviewed the top 100 web sites last year, it found that only 14 had posted details about their privacy policies.

A similar review, conducted last year by the Electronic Privacy Information Center (<http://www.epic.org>), checked the 100 most popular sites listed by Hot11 (<http://www.100hot.com>) and found

that about half of them collect personal information from users, often without their knowledge.

CHANGE IS A COMING

When the FTC returns to cyberspace for another round of audits, the agency will probably discover a much different situation. Web sites large and small have begun posting detailed explanations of what information they collect, how that information is used and what steps to take if you want to opt out.

Why the change? There are several reasons:

Consumers attitudes. Despite the growth of the Internet and online services, consumers still don't trust computers. A survey of 10,000 consumers last fall, by a research lab affiliated with the Georgia Institute of Technology, found that 72 percent of those users thought there should be new laws enacted to protect privacy online.

Privacy abuses. America Online assures its subscribers that it won't release personal information without a court order. But a Navy investigator had no trouble getting an AOL employee to disclose personal details about an AOL member who described himself as gay in an online profile.

Last summer AOL scrapped a plan to sell its member's home phone numbers to telemarketers only after members protested. With that kind of attitude on the part of the nation's largest online service, it's no wonder that online users are suspicious.

Business potential. Privacy is good for business, according to a 1997 study by TRUSTe (<http://www.TRUSTe.com>), a company that helps companies create web site disclosure statements. The company said it found that full disclosure of privacy practices would increase (by 50 percent) consumer willingness to make personalized Internet transactions.

And Forrester Research, a Massachusetts consulting firm, predicts that without adequate protection of consumer privacy, the current growth of the Internet as a commercial center could be temporarily stalled.

Government threats. Privacy concerns have caught the attention of lawmakers and other government officials. Last year Federal Reserve Board Chairman Alan Greenspan said the government might have to put controls on electronic payment systems to avoid "the risk of a gradual, long-term erosion of privacy."

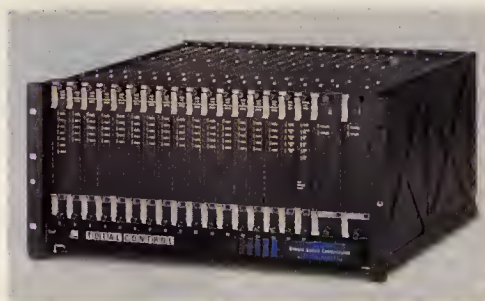
Ric Manning is a columnist and web master for *The Courier-Journal* in Louisville, Kentucky. His weekly column covers computers, consumer electronics and the Internet and is distributed to more than 100 newspapers by the Gannett News Service. It's also available on the World Wide Web at <http://courier-journal.com/gizweb>.

Ric was the founding editor of *Plumb* and *Bulletin Board Systems*, two newsletters that covered the BBS arena in the early 1980s. His freelance work has appeared in several magazines including *PC/Computing*, *Mobile Office*, *PC Week* and *Home Office Computing*. Ric lives in Southern Indiana with his wife, two children and two Weimaraner dogs.

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GOVERNMENT AND PRIVATE EFFORTS

The Electronic Communications Privacy Act of 1986 was amended to restrict how online services can provide data about their members to a government agency. But that pertains to restrictions giving information to private parties.

More than 80 bills have been proposed that would place some restrictions on the Internet, and a few deal with privacy concerns. One of the strongest would require Internet providers to obtain written consent from subscribers before giving their personal information to third parties.

The Clinton Administration, however, has urged the online industry to regulate itself and the TRUSTe program is one of the first efforts in that direction.

TRUSTe is a non-profit, industry-funded organization that awards an online trustmark to web sites that agree to disclose their privacy practices. TRUSTe's backers include IBM, CyberCash, Excite, Lands' End, Netscape and Oracle.

Some of the sites that display the TRUSTe logo include Alexa Internet, CommerceNet, Hamilton Securities, Great Foods Online and Henry and June, a site that sells lingerie.

"We wanted our online customers to feel at ease shopping in our store," said Doug Churchill of Henry and June. "We had heard that privacy concerns was one of the most mentioned reasons for NOT making a purchase online, so we joined TRUSTe to show our commitment to this issue. As a new site, we also think displaying the TRUSTe logo lends credibility to our name."

While some online sites are making a special effort to disclose and restrict data gathering, others are expanding their efforts. Engage Technologies (<http://www.engagetech.com>) introduced a product capable of building a database of more than 10 million online user profiles, gathered anonymously from its member sites, including the Lycos search engine. The profiles will be used to create targeted content and advertising.

Another company called LikeMinds (<http://www.like-minds.com>) is working with Columbia House to make the music marketer's web site even more personalized. In addition to creating profiles based on web activity, Columbia House will also use database information from its conventional direct marketing database.

The site will use an "agent" called eDNA that learns a user's interests and preferences, then matches them to profiles created from the company's pre-web data to recommend new products to the visitor.

Why are marketers willing to invest in such sophisticated technologies? LikeMinds explains in the first sentence on its own web page: "One-to-one marketing is the Holy Grail for marketers."

PRIVACY POLICY STATEMENTS

Here are some sample selections from privacy policy statements:

Land's End

(<http://www.landsend.com>)

"Profiling refers to using a customer's actions within an Internet site to draw conclusions about him/her. To use a fictional example, a customer who lives in Seattle and browses every umbrella offered at a site may well have a good statistical chance of buying one of those umbrellas. The company who sold the umbrella to the customer could then offer deals on other rainwear to the same customer based on how they surf the web and/or buy products off the web."

"At Lands' End, we do not currently use profiling in any way."

The New York Times

(<http://www.nyt.com/subscribe/help/privacy.html>)

"NYTEMC reserves the right to perform statistical analyses of user behavior in order to measure relative consumer interest in the

various areas of our site (for product development purposes) and to inform advertisers as to how many consumers have seen or "clicked" their advertising banners. In performance of these analyses, we will disclose information to third parties

only in aggregate form. Personal information on individual subscribers will not be provided to any third party."

Disney

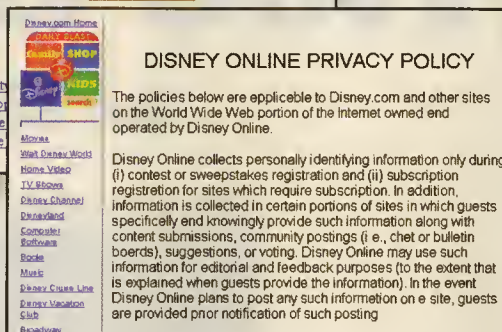
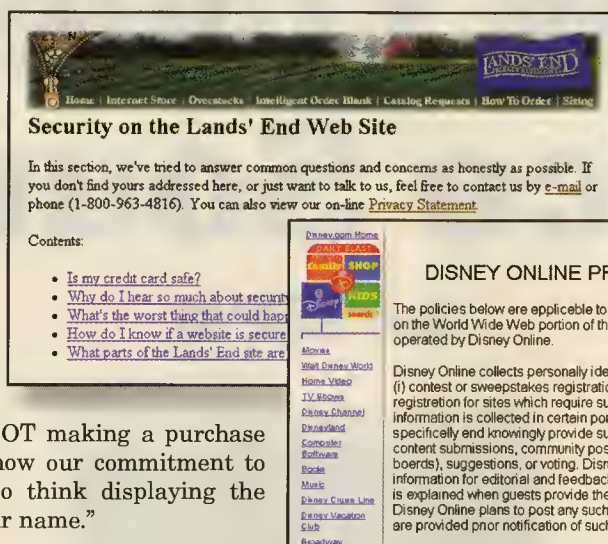
(http://www.disney.com/Legal/privacy_policy.html)

"Policies for Individuals 16 and Under: No information should be submitted to or posted at Disney Online's Web sites by children 16 years of age or under without their parent's or guardian's consent. Unless otherwise disclosed during collection, Disney Online does not provide any personally identifying information, regardless of its source, to any third party for any purpose whatsoever."

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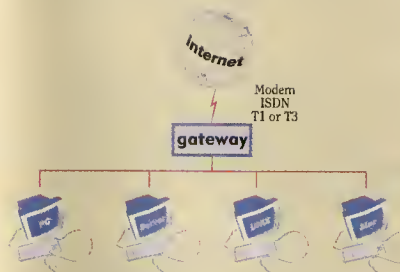
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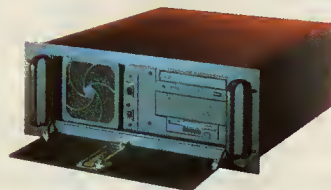
UGate

The UGate is the ideal solution for sharing one PPP Internet connection among a small workgroup. You no longer need accounts or phone lines for each user. Setup is easy. UGate includes a DHCP server that automatically assigns IP addresses to each computer on a local network. Configuration is controlled from your web browser. Dial-on-Demand keeps connection costs down. Finally, there's no special software to install on your clients.



SOHOConnect

SOHOConnect gives you the full set of Internet Servers in a single box: Web, FTP and email. It's perfect for the Small Office/Home Office environment. Like the UGate, SOHOConnect also includes a DHCP server and IP Masquerading. It's configured using a java interface, and can be managed from any web browser.



YESBox

YESBox is Your Everything Server with all the features and muscle you need to support the Internet at your enterprise. It includes a full suite of Internet servers (Web, DNS, FTP, email, etc.) and is configured from a Web browser. In addition YESBox includes advanced features such as a packet filtering firewall and virtual Web hosting. For more demanding needs YESBox is available with a T1 Frame Relay WAN interface and is rack-mount capable. ISPs can do all setup remotely for the end user by creating a YESBox config file and downloading the configuration to a YESBox by modem.

Features Comparison Chart

| | UGate | SOHOConnect | YESBox |
|------------------------|--|--|---|
| WAN Interfaces | RS-232 (supports external modem or ISDN) | 56K Modem RS-232 for external ISDN | 56K Modem T1/Frame Relay 10/100 Mbps Ethernet |
| LAN Interface | 10Mbps Ethernet | 10Mbps Ethernet | 10/100Mbps Ethernet |
| Web-based Config | ✓ | ✓ | ✓ |
| Dial-on-Demand | ✓ | ✓ | ✓ |
| IP Masquerading | ✓ | ✓ | ✓ |
| Web Server | | ✓ | ✓ |
| FTP Server | | ✓ | ✓ |
| POP3/IMAP Email Server | | ✓ | ✓ |
| WFW File Server | | | ✓ |
| NFS File Server | | | ✓ |
| IP Aliasing | | | ✓ |
| Packet Filter Firewall | | | ✓ |
| DNS Server | | | ✓ |
| ISP Remote Configure | | | ✓ |
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ISPS MARKET REPORT

Paul Stapleton

MORE BUYERS BUYING BASED ON FREE CASH FLOW DON'T FORGET TO CONSIDER LONG TERM OBLIGATIONS

On February 5, 1998 Concentric Network Corporation (Nasdaq-CNCX) bought all of the outstanding stock of InterNex Information Services Inc. (InterNex). We all know who Concentric is (for a refresher, read my February column at www.boardwatch.com).

InterNex was a typical ISP in the highly competitive San Francisco Bay area, offering typical services ranging from dial-up to high-speed dedicated, along with some hosting, training and consulting. However, InterNex had some meat on the top line, almost \$10 million per year in annual revenue.

Compared to other "non-national" ISP transactions done to date, Concentric paid a very high price-to-revenue multiple to acquire InterNex. I will argue they paid almost 2.8 times sales. But I will also argue, they still got a very good deal when you look at the transaction with free cash flow in mind.

In fact, for the rest of 1998, regional ISPs with a big top-line number (and that's highly relative), generated from a highly concentrated geographic locale, are holding a lottery ticket if they want to cash it in. Even if business to date has only been mediocre. This deal shows why.

InterNex was in a financial jam. They were out of cash and stretched on bank lines. For the year ended 1997, InterNex had revenue of \$9.954 million, while losing \$6.911 million from operations. Throughout calendar year 1997, top-line Internet access growth had slowed, showing only a 5.9% annualized increase from the first half of calendar 1997 (\$4.685 million to \$4.823 million). Total access revenue for calendar year 1997 was \$9.508 million.

In the financial statements (the most recent Concentric 10-K), Concentric says they paid \$23.9 million to acquire InterNex. That amount consisted of \$15.5 million cash, assumed InterNex liabilities of \$6.6 million and transaction costs of \$1.8 million. (Some expensive bankers and lawyers were in on this deal.)

But even SEC sanctioned financial statements sometimes do not capture the whole picture. And I have been looking for a way to make a point about the industries practice of entering long term non-cancelable telephony contracts.

Using some assumptions, I want to argue Concentric paid \$2.629 million more to acquire InterNex for a total acquisition cost of \$26.5 million.

Remember, Concentric bought the common stock of InterNex. That means they assume all obligations of

InterNex. If you look deep in the footnotes, (it's not on the balance sheet) you learn those obligations include "certain non-cancelable operating lease agreements with several telephone companies" called connectivity agreements in the footnote. Do these types of agreements sound familiar to other ISPs?

Concentric has an obligation to pay for these connectivity agreements, whether they use them or not. My assumption is, given Concentric's existing network, they do not need these telephone agreements. For Concentric, these agreements are not balanced assets and liabilities, but all liabilities. They don't need it, but they have to pay for it. My second assumption is they do not have sufficient leverage with the supplier to get them canceled or materially modified. Of course, I could be wrong. But I'm trying to make a point.

These non-cancelable, connectivity agreements are an additional cost of the transaction not posted to the balance sheet. But how do we know the "value" or "cost" of these agreements? In short, we need to calculate the present value of these payments. The footnote tells us the payment stream over five years. It does not tell us the discount rate (and we need that to calculate present value).

Fortunately, the footnote does tell us the present value of the capital leases. Consequently, we can calculate the imputed interest rate of the capital leases and somewhat comfortably turn around and use that interest rate for the connectivity agreements.

Using the imputed interest rate of the capital leases, in this case 10.8 percent, we calculate the present value of the connectivity agreements to be \$2.629 million.

So, I argue Concentric paid \$26.5 million to acquire InterNex, rather than \$23.9 million (10 percent more).

In ISP M&A circles we are still talking about valuations based on price-to-revenue run-rate. Using that metric, one could say InterNex sold for 2.78x its Internet access revenue (\$26.5 million divided by \$9.508 million).

NETCOM, another "no growth, cash flow negative" ISP, but with substantially more strategic importance and revenue girth, sold in October 1997 for 1.5x revenue. Times (and prices) have changed. Why?

Strategic buyers are playing. Internet backbone providers, of which Concentric is one, and CLECs are out buying in full force. They need traffic for the networks they have, or are deploying. And as I said before, this business is not like the movie *Field of*

After bouncing back and forth between finance, publishing and the Internet, Paul Stapleton has landed squarely in the middle. He is Managing Director of Stapleton & Associates, an Internet focused financial consulting firm. Clients include major players as well as start ups and middle market companies in media, telecomm and software.

Paul Stapleton is also editor of *ISP Report* (to subscribe, e-mail ispreport@mediabiz.com or call 303-271-9960 or fax 303-271-9965; annual rate is \$195; sample issue sent on request) the newsletter of record for financial activity in the ISP industry. Paul welcomes comments and suggestions at paulstapes@aol.com. He lives in Boulder, Colorado with his lovely new bride.

Dreams; if you build it, they will not necessarily come. Pull out the *Boardwatch* directory. Look at that list of backbone providers. Almost all of them need traffic.

Additional deals already announced include, privately held SAVVIS Communications, out of St. Louis, buying Interconnected Associates Inc. in the Pacific Northwest. Qwest buying SuperNet, and the RCN Corp. purchases of UltraNet and Erols.

More ISP buyers in 1997 than 1998 has pushed prices up. The days of buying between 1.5x and 2.0x revenue, a la Verio Inc., are quite possibly over.

But wait a minute, Concentric isn't a foolish company. More buyers doesn't mean one should pay too high a price. And they have Broadview and Associates, an established IT investment bank helping them (remember those fees).

The price-to-sales multiple Concentric paid for InterNex is pretty high. However, it is also pretty darn low for a price-to-free-cash-flow multiple. Let's look at the incremental free cash flow Concentric can get out of this deal.

InterNex is located in Santa Clara, CA, and operates primarily in the San Francisco Bay area. That's right in Concentric's backyard.

So when Concentric bought InterNex, what happened to InterNex's \$9 million in network expense, as well as the \$4 million in sales and marketing, and the \$2.9 million in general and administrative expense? I will venture to say it disappears.

For a buyer like Concentric, that already has almost 100 percent network, marketing and management overlap in the same geography, and probably a lot of existing free capacity, buying InterNex's revenue stream is almost like buying pure free cash flow. Almost all the revenue can be taken straight through the income statement to the bottom line.

I'm going to assume the InterNex revenue stream still has direct expenses of 20 percent associated with it for account management. That means free cash flow off the InterNex acquisition is \$8.0 million.

Based on these assumptions, Concentric acquired InterNex for 3.3x free cash flow. And InterNex principals get to walk off with \$15.5 million, days after they were about to run out of cash. How is that for a deal? ♦

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| Symbol | Exchange | Company | Price 1/6/98 | Price 2/5/98 | Price 3/9/98 | Percent Change | Shares (millions) | Market Capitalization |
|--------|----------|-------------------------------|-----------------|-----------------|-----------------|-------------------|----------------------|--------------------------|
| ATHM | NASD | @Home | \$22.63 | \$24.75 | \$37.00 | 49.49% | 117.52 | \$4,348.24 |
| AOL | NYSE | America Online Inc. | \$90.00 | \$98.06 | \$61.69 | -37.09% | 95.86 | \$157.55 |
| CNCX | NASD | Concentric Network Corp. | \$10.00 | \$11.50 | \$13.88 | 20.70% | 13.51 | \$186.44 |
| ELNK | NASD | EarthLink Network, Inc. | \$24.50 | \$31.81 | \$55.38 | 74.10% | 9.68 | \$536.08 |
| IDTC | NASD | IDT Corporation | \$20.69 | \$29.31 | \$37.38 | 27.53% | 9.89 | \$369.69 |
| MCOM | OTC | Metricom Inc. | \$9.25 | \$11.97 | \$10.13 | -15.37% | 13.61 | \$137.87 |
| MSPG | NASD | MindSpring Enterprises, Inc. | \$28.75 | \$39.00 | \$63.63 | 63.15% | 7.48 | \$472.36 |
| OZEMY | NASD | OzEmail Ltd. | \$9.56 | \$8.38 | \$9.88 | 17.90% | 10.20 | \$100.78 |
| PSIX | NASD | PSINet Inc. | \$6.53 | \$7.63 | \$9.31 | 22.02% | 40.27 | \$374.91 |
| RMI | NASD | Rocky Mountain Internet, Inc. | \$3.00 | \$2.31 | \$2.13 | -7.79% | 4.65 | \$9.90 |

ISP Report Index

\$20.03

\$23.27

\$30.04

\$6,693.82



ISP MATING RITUALS by Bill McCarthy

FRONTIER AND L3 SITTING IN A TREE...

Level 3 Communications, Inc. and Frontier Corporation announced an agreement March 24 enabling Level 3 to lease capacity on Frontier's 13,000 mile SONET fiber optic, IP-capable network for a period of up to five years. Worth about \$165 million, the leased network will initially encompass 8,300 route miles of OC-12 network capacity, connecting 15 of the nation's largest cities.

In a press release, James Q. Crowe, president and CEO of Level 3 said: "While we are building our own IP-based network, this lease arrangement will give us a network over which we can begin providing service to business customers in several cities during the third quarter of 1998."

This is why we love press releases; they always put the CEO on a soapbox, even when he has nothing to say. It is probably best to have a network then provide the service.

But the soapbox didn't get any better for Joseph P. Clayton, president and CEO of Frontier Corporation: "This agreement leverages our world-class network and data expertise by implementing a leading-edge data and Internet strategy."

Huh?

This could be the start of a beautiful relationship.

Fortunately, we don't have to understand what they're saying, just watch what they do. They plan plenty of bandwidth to play with. L3 recently split from PKS and is running away from Omaha to Colorado. L3 plans to build a national fiber optic IP network. The company is going to need some help to operate that network and deliver the full range of communications services. Frontier, a Rochester, New York-based telco, bought GlobalCenter, a company that's doing some interesting digital distribution of web sites, built on an ATM backbone, much of which just two years ago belonged to PrimeNet.

K-I-S-S-I-N-GST...

Expanding its regional foothold in the Internet and data services market and signaling its intent to become an Internet player, GST Telecommunications, Inc. announced March 17 that it has entered into a definitive agreement to acquire the assets of Whole Earth Networks, LLC, a San Francisco-based Internet service provider. The company will become part of GST's data services operations and will retain the name Whole Earth Networks, Inc.

Under the terms of the agreement, GST (AMEX: GST) will acquire the assets of Whole Earth for about \$9 million in cash and assume some of Whole Earth's debt. Whole Earth is one of the oldest full-service Internet service providers, serving both residential and commercial customers. It claims one of the largest regional backbones with connections at three network access points and peering with about 60 ISPs. The closing of the acquisition is subject to certain conditions.

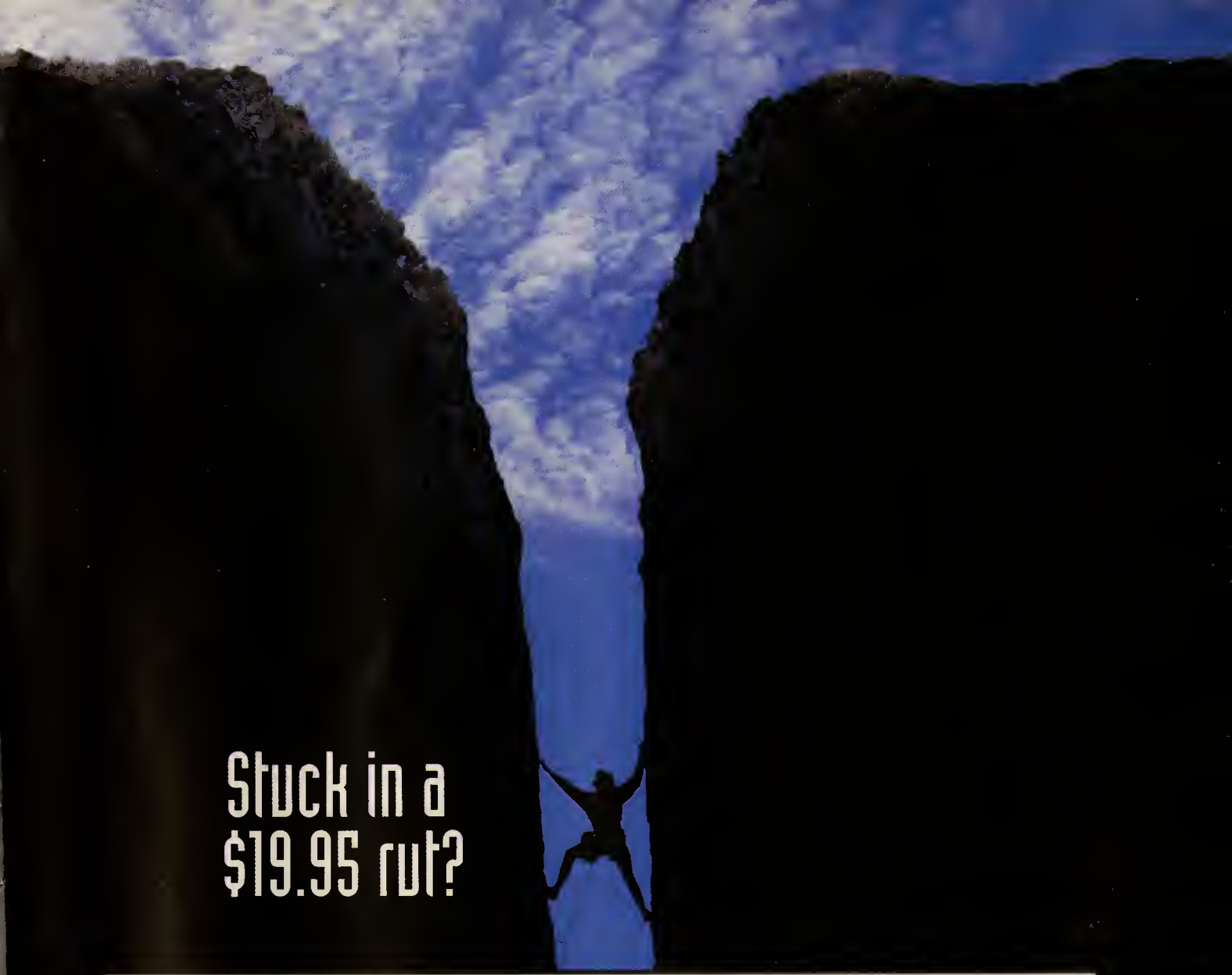
GST is adding a great deal of infrastructure in the Western United States and integrating an influential and experienced ISP in San Francisco appears to be a logical move. With more than 14,500 subscribers for Internet service, Whole Earth supports a full range of connectivity from dial-up to T-3. Whole Earth is probably best known as the provider for The WELL, one of the Internet's oldest online communities.

Whole Earth's operations will be linked to GST's regional fiber-optic network, which includes a 500-mile long-haul system connecting San Francisco and Los Angeles, as well as links to Las Vegas, Phoenix, and Tucson. For the past three years, GST has expanded its Internet operations by acquiring Internet service providers, including Hawaii OnLine — Hawaii's largest ISP — and integrating them into the company's comprehensive package of advanced telecommunications products and services.

On March 12 GST said it purchased Call America Phoenix. Under the terms of the agreement, GST acquired 100 percent of the outstanding capital stock of Call America Phoenix. Call America posted annual revenues for the 12 months ended December 31, 1997, of about \$5.4 million and positive Earnings Before Interest, Taxes, Depreciation, and Amortization. The acquisition will bring significant traffic to GST's new switching facility in Phoenix, take advantage of fiber acquired in November between Phoenix and Tucson, as well as connections it recently developed between Phoenix, Las Vegas, and Los Angeles.

The acquisitions are part of GST's strategy to focus on its Competitive Local Exchange Carrier (CLEC) business in the West and connect CLECs with long-haul fiber.

The acquisition of Call America Phoenix is a direct result of the recent appointment of company founder Kathryn Proffitt as U.S. Ambassador to the Republic of Malta. Proffitt founded Call America Phoenix in 1983.



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FIRST COMES LOVE FOR QWEST IN EUROPE ...

As of late March, Qwest Communications International Inc. appeared to be wooing European Internet-access provider EUnet International Ltd., which it is said to be ready to buy in a stock and cash transaction valued at slightly more than \$150 million. But this romance appears to still be in the closet for moment. No official confirmation was released.

The purchase would give Qwest one of Europe's fastest-growing Internet providers. EUnet, based in Amsterdam, has a network connecting 60,000 business customers in 13 European countries.

Qwest aims to become a specialist in providing high-speed data and phone services using Internet-protocol on fiber. Qwest, announced a \$4.4 billion purchase of LCI International Inc., the nation's fourth-largest long-distance company less than a month earlier. Other recent acquisitions include Colorado Supernet, a Denver ISP, and Phoenix Network Systems, a long-distance reseller. To link everything, Qwest has network agreements stretching across the U.S. into Mexico and across the Atlantic into Europe via transatlantic high-capacity fiber links.

The European drive will be the fourth acquisition for Denver-based Qwest, which is building a high-capacity fiber-optic network. Qwest is starting to look like WorldCom, using its soaring stock price to buy a major position in the industry.

THEN COMES MARRIAGE FOR NORTEL AND APTIS ...

Northern Telecom said in March that it will buy Aptis Communications, Inc., a Massachusetts-based, remote-access data networking start-up company, for about \$290 million in Nortel common stock and cash.

Nortel is in love with Aptis of Chelmsford, Massachusetts, because it is a developer of carrier-class access switches, including the CVX 1800, for network service providers, carriers and Internet service providers. Nortel sees the acquisition as an opportunity to take the lead in in the access and virtual private networks (VPN) arena and the company said it demonstrates its commitment to building a faster, more reliable, more profitable Internet.

With the CVX1800, Nortel, which had 1997 revenues of \$15.5 billion and has 73,000 employees worldwide, will be in a stronger position to deliver integrated voice and data on an IP network. The CVX 1800 will be an important part of Nortel's just@sk Multi-Service Access strategy. Nortel plans to deliver more capability to the product with the addition of DSL, SONET and SS7 interfaces, network intelligence and network management capabilities. The product will be integrated into Nortel's Internet Thruway and Multi-Megabit network products already in service with carriers and ISPs across the U.S.

Aptis will operate as a separate business. Paul Gustafson will remain president of Aptis and will also become a Nortel vice-president and general manager. The transaction is expected to close in the second quarter of 1998 and is subject to government regulatory approval and other conditions.

THEN COMES MCI WORLDCom IN A BABY CARRIAGE...

ROMEO AND JULIET ACT I, SCENE V

Enter star-crossed lovers Romeo WorldCom and Juliet MCI on March 11 to name their selections to serve on the board of direc-

tors of the MCI WorldCom company once the marriage is blessed by U.S. and European regulators.

Narrator: The 17-member board will consist of 11 outside members, including eight named by WorldCom and three named by MCI, as well as six officers of the companies. The directors will be elected annually by shareholders.

Romeo (WorldCom): WorldCom selections are:

- James C. Allen, former CEO of Brooks Fiber Properties, St. Louis
- Carl J. Aycok, director, Master Corporation, Brookhaven, MS
- Max E. Bobbitt, president and chief executive officer, Metromedia Asia Corporation, New York
- Stephen M. Case, chairman and CEO, America Online, Inc., Dulles, VA.
- Francesco Galesi, chairman, Galesi Group, New York
- Stiles A. Kellett, Jr., chairman, Kellett Investment Corp., Atlanta
- John Porter, chairman and CEO, Integra Funding and Industrial Electric Manufacturing, Inc., and chairman of Phillips & Brooks/Gladwin, Inc., Fisher Island, FL
- Lawrence C. Tucker, partner, Brown Brothers Harriman & Co, New York

Juliet (MCI): MCI selections are:

- Clifford L. Alexander, Jr., president, Alexander & Associates, Inc., Washington, D.C.
- Judith Areen, executive vice president, Law Center Affairs, Dean of Law Center, Georgetown University, Washington, D.C.
- Gordon Macklin, chairman, White River Corporation, Washington, D.C.


Press Release, (chief servant of the couple): MCI WorldCom Directors and Officers are:

- Bert C. Roberts, chairman, MCI; will be chairman of MCI WorldCom
- Bernard J. Ebbers, president and CEO, WorldCom; will serve as president and CEO of MCI WorldCom
- Gerald H. Taylor, CEO of MCI; becomes president and CEO of MCI WorldCom International
- John Sidgmore, chief operations officer of WorldCom; will be president and CEO of MCI WorldCom Internet/Technology and Solutions
- Tim Price, president and chief operating officer of MCI; becomes president and CEO of MCI WorldCom's U.S. communications subsidiary
- Scott D. Sullivan, CFO and Secretary of WorldCom; named as CFO of MCI WorldCom

Enter WorldCom and MCI shareholders

Press Release: Both WorldCom and MCI shareholders overwhelmingly approved the pending merger between the companies during meetings held March 11 in Jackson, Mississippi, and South Sioux City, Nebraska. The merger, first announced on November 10, 1997, is still subject to approvals from the U.S. Department of Justice, the Federal Communications Commission, and the European Commission, among others.

Exit all. ♦



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STREAMING MEDIA by Doug Mohnhey

GUNFIRE AND FLAMES - VIDEO ON THE NET '98

Before we begin—

As we go to press, RealNetworks has purchased Vivo Software for \$15 million. Vivo investors get some money out of the deal while Real gets a set of building blocks for better production tools.

Microsoft and RealNetworks are going to square off like sumo wrestlers over the Internet broadcast space and woe unto any poor innocent squashed in the middle.

Have you cut yourself a buyout deal today?

By the time you read this, I should have my web site and e-mail address moved from Verio affiliate Clark.Net to another location. Having e-mail to editor Sahib Steve bounce multiple times across a three-month period was bad enough. Worse was having customer "support" gripe about my attitude when I lost it, followed by some excuse that it was MCI's fault until Clark.Net migrates onto the Verio backbone. Not to mention the out-of-the-blue, weird message from a Northern California Verio affiliate saying I should be nicer about system outages.

FREE EXCITEMENT

It's rare to get a letter warning, "There will be brief intervals of automatic weapon fire through out the evening." However, guests checking into the Westin Long Beach for the Video on the Net conference on Tuesday evening, February 10, 1998, received such a letter from F. Stanley Pearse, Jr., location manager of *Lethal Weapon 4*.

Lethal4 (www.1ethal4.com) as it is billed, was filming second unit shots (i.e. no Mel or Danny) on First Street, behind the Westin, between 6 p.m., Tuesday, February 10, to 6 a.m., Wednesday, February 11. Of course, I was hoping for a room overlooking First Street, but instead I got the pretty ocean view. Figures.

Some of the conference attendees didn't get the letter and called down to the front desk in a panic at 3 a.m. (between the gunfire and shooting flames, when the movie crew started burning propane by the tank).

EYE-OPENING

Video on the Net '98, which ran from February 11-12, was like a cup of espresso—small, freshly brewed, and strong. Attendance was close to 100 people, not an overwhelming number, but quality, not quantity, was the key in the two-day series of keynotes and panel discussions.

The greatest measure of success for the conference was Jeff Pulver's first day declaration at about noon to hold a fall "Video on the Net" at the Puck Building in New York City, possibly in October.

Concentric Network (www.concentric.net) and ITV.Net (www.itv.net) chose the occasion to announce their Internet Broadcast partnership, an interesting if not unexpected announcement from Concentric. The national ISP has chosen to hoist a flag on quality of service applications such as voice. Video should be a natural progression.

So too is the partnership between an ISP and one of the leaders in live Internet video broadcasting. PSINet's partnership with TV on the Web set the tone for Internet broadcast and video ventures and it's likely that UUNET is considering their own "official" partnership with one or more companies.

From ITV.Net's perspective, Concentric has the bandwidth, private peering arrangements, and collocation facilities necessary to maintain a high-quality, Internet broadcast network. The two companies' bundled services provide turnkey packages for web hosting, live event management and on-demand projects. Furthermore, ITV.Net has developed a set of tools to handle large libraries of on-demand media as well as live event scheduling and server management.

U-cast (www.u-cast.com), a division of First Confer-ences, Ltd. (UK-based), announced themselves as well. U-cast describes themselves as a "...video-over-IP web site that teaches the world about video-over-IP."

I'm not really sure how much teaching can take place if people can't get browser plug-ins working, but the site is supposed to hold a mixture of interviews with industry personalities, case studies, and related technologies. I'm also skeptical about the site's description as a "...hybrid of a Business to-Business broadcast station, a destination web site, a distance learning center, and an online conference."

Too many functions for two many people.

In addition, the online conference gimmick was tried and died at least two years ago. Does anyone remember the "Online World's Fair" or attempts to put several of the name-brand trade shows in virtual form? Didn't think so.

There was also grumbling in the hallways about the IPMI "IP Multicast Summit" held earlier in the week. One Video on the Net panelist suggested that the

Doug Mohnhey was employee #10 at DIGEX. He has learned, and forgotten, a lot about help desk support, competitive intelligence, sales and marketing, leased-line service ordering, telco service, and public relations. He makes no pretenses at understanding anything more about the technical side of IP other than being able to get a PPP account working.

His writings have been published in *LA View*, *Washington Technology* and the *Washington Post*. Doug receives e-mail at moo@clark.net.

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efforts to hold the Multicast Summit might have been better spent presenting to the hard-core Internet systems operations people at the North American Network Operations Group (NANOG) meeting in Albuquerque, New Mexico, scheduled by accident or design on the same days.

NANOG attendees are the people holding the passwords to the major Internet infrastructure, including the routers that need to be multicast enabled. They'll also be the ones who negotiate multicast peering arrangements at the Tier 1 level.

KEYNOTES

Keynote speeches are always interesting. Speakers are typically higher on the food chain than the people seated on multi-person panel discussions and receive dedicated time to talk about their world-view, one that typically reflects that of their companies.

A good keynote speech can reveal the future business plans and intentions of a company in an extremely entertaining fashion. A bad keynote speech is nothing more than warmed over marketing drivel worked over to burn time.

Fortunately, none of the Video keynotes were marketing drivel. Mark Cuban, president of AudioNet (www.audionet.com), Phil Barrett, senior vice president of RealNetworks (www.real.com), Connie DeWitt of Concentric Network, Nick Boris, a producer at ABC News (www.abcnews.com) and Asaf Mohr, president of VDONet (www.vdonet.com), all gave keynotes.

Cuban, described as a "next generation broadcaster" by Jeff Pulver, outlined a future of the Net where traditional television would be displaced by a combination of IP multicast and higher bandwidth into the home. He also highlighted AudioNet's VIP (Video IP?) program, designed to encourage ISPs to multicast unique AudioNet video programming in exchange for some financial incentives. He predicted that full motion/full screen IP video would be available in as little as 500K of bandwidth within two years.

Nick Boris symbolized traditional broadcast media, with one foot in the past and the other in the electronic world. The Internet, as evidenced by ZipperGate and foreshadowed in Tomorrow Never Dies, has accelerated the pace of traditional news reporting, putting TV networks in the position to conduct true 24 x 7 reporting on the Internet. He said that the Internet's reach as an international medium would shape the presentation of the news for overseas audiences as well as provide an attractive avenue for international advertising dollars.

Asaf Mohr of VDONet (www.vdonet.com) also represented a company on the edge. VDONet was once the market leader in streaming video but now is working to survive in a Microsoft NetShow/RealNetworks-owned world.

VDONet has deployed software technology that will support full screen, 24 frames per second IP video at a paltry 750K per second. A private IP broadcast network has been set up using technology and Gilat satellite hardware (www.gilat.com). In addition, he showed off the VideoDome web site (www.videodome.com), a video-on-demand site that holds a variety of movie trailers, infomercials and other video.

SHIFTING WORLD-VIEW FROM THE NORTH

Between seminars, I spoke with William Mutual, President and CEO of ITV.net. ITV.Net built a rep as a "Have event, will webcast" firm, with events ranging from the U2 "Popmart" world tour opening in Las Vegas, to the Cannes Film Festival. If you needed a video commando to go to exotic locations and film extreme events, the Vancouver/Los Angeles company was the one to call.

For example, video broadcasting the U2 "Popmart" opening—a last minute, on-the-fly favor for Radio Ireland—required a series of juggling tricks that included converting from European PAL-standard video to North American NTSC on the fly, and borrowing the battery out of a Dodge Neon. However, very cool but very expensive live event broadcasts didn't pay the bills. Many people balked at the \$10,000/day price tag for a professionally experienced crew and thought they could get by with lower-priced talent.

ITV.Net refocused into three market niches: corporate communication, distance learning and education, and television simulcast. Teaming with Concentric gave ITV.Net access into the corporate and high education markets and ITV.Net's status is boosted by the Williams Communication connection. Williams owns a piece of Concentric and has a spanking brand new fiber network waiting to be filled.

Television simulcast is proving to be the most interesting niche for ITV.Net. "One third of the broadcasters love us, one third of them just don't get it, and a third of them fear us. There are no fence sitters," Mutual said. He was very bullish on the future, saying that ITV.Net's streaming media broadcast network management and streaming media asset management (what mouthfuls!) will provide a key advantage in the distance learning market.

THE AUTO CHANNEL - A MOO BLUE RIBBON

Marc Rauch, executive vice president of the Auto Channel (www.theautochannel.com) gave one of the more entertaining presentations on the first day. Marc, and one of his partners, had been in traditional broadcast in the '90s but had an itch to start their own cable channel focused on (what else?) cars.

While they worked on logos, content, and a way to get their channel on the air, along came the Internet. Needing financing to start up their web site, they pitched a major corporate sponsor on the concept of The Auto Channel—no existing web site, no proof anyone would visit it, just a good idea. Marc proved to be an excellent salesman since the corporate sponsor agreed to sign up with nothing more than the presentation. The rest, as they say, is history.

The Auto Channel gets a "Moo Blue Ribbon" for several reasons. Marc Rauch is one hell of a presenter; he was mobbed with questions after he spoke. NASCAR racing is down there with curling on my list of favorite sports, but The Auto Channel is a work of art in terms of web site design, unique video content, and comprehensive information about the automobile industry. The Auto Channel sends out film crews to major road races to report live.

Finally, the existence of the Auto Channel on the Net proved one of my earlier statements at the conference—the Internet will be a cost-effective, bypass delivery mechanism to deliver video programming (content) around the bottleneck of traditional broadcast and cable channels.

Many small to mid-sized cable channels find themselves fighting to be put on the lineup of 40-150 channels available in cities across the country; Rupert Murdoch found himself locked out of New York City when he tried to get his CNN-clone put onto the cable box. Can't see South Park because your local cable company doesn't carry Comedy Central? Check the Net for a RealNetworks' bootleg copy.

OTHER HIGHLIGHTS

John Ryan, one of the founders of Ryan Hankin Kent, a telecommunications analyst group located in San Francisco (www.rhk.com), offered some interesting insights into the future of hardware, software, and bandwidth deployment necessary to support large Internet broadcast audiences.

Haven't heard of them? I first bumped into the RHK people at the Summer '97 ISPCON and was very impressed at their depth and insight into the complicated world of Internet video. While they haven't send me a copy of their reports for review (hint-hint), I suspect they're worth the price based upon my conversations with them.

RHK probably has one of the more well-heeled staffs in the industry; John Ryan did his doctoral work in laser physics at the University of London, Imperial College, and his cohorts are equally highbrow. Visit their web site for no other reason than to read the paragraph briefs.

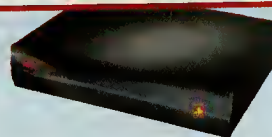
OF PAST AND FUTURE

Jeff Pulver has declared his intention to hold a fall "Video on the Net" conference at the Puck Building in New York City. Stay tuned. ♦

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CONSUMMATE WINSOCK APPS by Forrest Stroud

THE DEBUT OF SERVERWATCH

This month marks the debut of CWSApps' first companion site, ServerWatch, located at <http://serverwatch.internet.com>. Originally designed by Keith Allison for Mecklermedia Corporation, ServerWatch has been entirely redesigned and redeveloped with one goal in mind—to be the quintessential resource for Internet servers. While CWSApps will continue to focus on the client side of Internet software, ServerWatch will now perform the same role for the server side.

The great reviews, attractive interface, up-to-date listings, one-step downloads, and extensive software coverage that you find now in CWSApps will carry over to ServerWatch. Everything from the most popular web servers to news, mail, chat, FTP, proxy, and list servers, as well as the most comprehensive listing of web development tools on the Net, will be listed and reviewed by ServerWatch. No site on the Internet will offer a greater level of depth and breadth for server information than ServerWatch, and no site will keep you as current with server news as ServerWatch. But don't take my word for it, check it out for yourself—<http://serverwatch.internet.com>.

In honor of ServerWatch's debut, this month we take a look at several of the Internet's most popular servers...

War FTP Daemon

| | |
|-------------------|---|
| Desc: | An extremely impressive freeware FTP Server for Windows 95 and Windows NT |
| Pros: | Excellent selection of features, extensive security options, the premier FTP server on the Net, freeware! |
| Cons: | Requires either Windows 95 or Intel version of Windows NT and a 486+ processor |
| Location: | http://www.jgaa.com/downloadpage.htm |
| Status: | Freeware |
| Platforms: | Windows 95/NT |
| Author: | Jarle Aase |
| Web site: | http://www.jgaa.com/tftpd.htm |

Unquestionably the premier FTP server for Windows 95/NT, **War FTP Daemon** is an excellent freeware server designed to meet and exceed all of your needs, whether you're a novice just starting out or a pro wanting to host a variety of virtual FTP servers.

War FTP excels in numerous areas including performance, ease of use, support for virtual servers, price (or lack thereof), security options, customization capabilities, and the most extensive feature-set available for a FTP server. The daemon is also compatible with every major FTP client, including Cute-FTP, WS_FTP, and the server's own companion client, War FTP, as well as the built-in FTP clients of Microsoft Internet Explorer and Netscape Communicator.

Among the server's many features are multithreading capabilities, multihoming/multihosting support (allows you to setup multiple virtual FTP servers on the same machine), open standards compliance (with full support for RFC 959 and 1123), a BBS-like Windows interface (one that's intuitive enough, but unfortunately not all that attractive), a system tray-bar icon (changes color when online/offline and when users connect/disconnect), support for ABORt and REST commands, ability to run as a Windows NT system service, proxy/firewall support, online and offline modes of operation, import database capabilities for FTP Serv-U, full OLE support, an option for handling 'brain-dead' ISPs (those that try to block out personal FTP sites), a virtual file system for improved performance and functionality, an automatic shutdown option, context-sensitive help, and support for long filenames.

What really sets War FTP Daemon apart from the competition is its extensive security capabilities. Numerous configurable options are available for each user, group of users, class of users (guest, sysadmin, user, or visitor), or all users (default security preferences). Security options that can be set include upload/download restrictions and ratio options for both anonymous and regular users, extensive logging capabilities (tracks number of times connected, files uploaded, files downloaded, etc.), file access permissions (read, write, execute, and delete options that can be set for specific files and directories), access restrictions (by password or e-mail address), file ban capabilities, limits on the maximum number of concurrent connections, and access list masks.

War FTP Daemon's intuitive interface and its easy-to-follow menu options make configuration and administration tasks simple. You can even have the interface hide the more complex options if you're a beginner (all program options are displayed by default).

The server also includes extensive help documentation, links to the web site's technical support section, and the War FTP FAQ for users in need of additional help in setting up and administering the server.

The applications reviewed here and many more are available at Stroud's Consummate Winsock Apps List, www.stroud.com and <http://cws.internet.com>.

Forrest Stroud currently works in College Station, Texas, as a web developer for Mecklermedia Corporation. He recently graduated, with honors, from The University of Texas at Austin. The Information Systems and Data Communications Management major enjoys spending what little free time he has with his wife Joanne and the "zoo" — an ever-expanding collection of dogs and cats that currently consists of a Dalmatian pup (Svoda Pop), a chocolate Lab cross (Roemer), a German Shepherd pup (Marius), and a pair of rascally kittens (Odie Pez and Bo Miggy). Animal lovers can check out pictures of the pets on Stroud's home page at <http://home.sprynet.com/sprynet/neuroses>



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Additional help is available in the form of an e-mail support address at support@mail.jgaa.com and a public newsgroup at alt.comp.jgaa.

The best news is that most users won't even need to access any of the help resources. You can be up and running your own FTP site with War FTP Daemon right after installation, or you can choose to first customize the server before hosting a site. When running War FTP Daemon, the system traybar icon will display different colors depending on the status of the server—light blue when the server's offline, yellow when the server's online but idle (no connections), and green when online and serving one or more connections.

You can also extend the capabilities of the server by downloading one of several War FTP Daemon utilities located on the War FTP Daemon web page. Among the utilities are DevScript, a plug-in upload processing script that allows for archive testing and similar file operations, and Process32, a plug-in verification script designed to check compressed archives that were uploaded to your site.

The Internet community has been anticipating the next major release of War FTP Daemon, v1.70, for some time now—and for good reason. While the new version has been delayed several months, its release—and a wide array of new features along with it—is expected soon.

One of the most important additions will be remote administration capabilities with full access to the management display when the server is running as a Windows NT system service. The new version will also use the Windows NT user database as an integrated part of the server's own user database.

Additional features will include disk quota limitations, a remote administration API, new text macros, expiry methods on user accounts, time-of-day login restrictions, a low-level socket engine, and an entirely redesigned interface. Versions for Linux and a variety of Unix platforms are expected to finally debut shortly after the release of v1.70 for Windows 95/98/NT.

DNEWS News Server

Desc: An excellent and extremely proficient NNTP news server for all levels of use
Pros: Excellent set of features, blazing performance, dynamic sucking feed capabilities, cross-platform support
Cons: Installation and administration could be made easier for novices, sub-par Macintosh version
Location: <http://netwinsite.com/download.htm>
Status: Free 14 day evaluation. Shareware - \$10
Platforms: Windows 95/NT, Unix, Macintosh, OS/2, VMS, Novell Netware
Company: NetWin, Ltd.
Web site: <http://netwinsite.com/dnews.htm>

While many users are familiar with newsreaders like Forte Agent, Anawave Gravity, and Microsoft Outlook Express, relatively few people know that you can do more than just read Usenet news on the Net—you can serve it as well.

Enter **DNEWS News Server**. DNEWS is designed to overcome the limitations prevalent in the traditional INN and CNEWS-based news servers typically used by ISPs and larger organizations. The server isn't just for the big boys, though; DNEWS has also been created with the purpose of making the power of Internet news services available to anyone and everyone. As a result, DNEWS gives individuals, workgroups, small businesses, ISPs and corporations the ability to host Usenet newsgroups and local news and discussion groups that can be served either publicly over the Internet, or privately over local networks.

DNEWS is extremely flexible and is designed to accommodate users of all levels, from the novice netizen to the news guru, and everyone in between. The server combines ease of use and cross-platform compatibility with a rich and extremely powerful feature-set to ensure that any user can run the server. And while it still not as easy to get up and running as a standard newsreader client like Agent, most users will be able to install and configure DNEWS within an hour.

The best part is that after initially setting the server up, everything else is a breeze. DNEWS is designed to run unattended and will perform all of its tasks in the background while you work on other projects. The result is virtually no ongoing administration time and none of the costs normally associated with manually maintaining a server.

DNEWS offers a wide variety of features that will appeal to users of all levels. NNTP streaming extensions (which can increase the throughput of a large feed over slow links by more than 200%), support for standard MIME types and image formats (like GIF and JPEG), built-in SPAM protection (which can cut SPAM by up to 99% using advanced filters and auto-detection mechanisms), a News to Mail gateway, optional PGP authentication, live feed technology, XOVER support, full access control, and intelligent expiration capabilities barely scratch the surface of DNEWS' extensive collection of features. Cross-platform support is another of the server's strong suits. Versions are currently available for Windows 95/NT, OS/2, Macintosh, VMS, Novell Netware, and a wide variety of Unix platforms.

Perhaps the best feature of DNEWS is its unique dynamic sucking feed mechanism. This option allows DNEWS to receive and maintain only those newsgroups that are actively read by users, which in turn allows you to provide all the benefits of a full news feed service while simultaneously avoiding the considerable bandwidth and disk space required by a full feed. This results in the ability to serve a group of 100 users on as little as 100 MB, and a single user with only 5 MB of disk space and a standard dial-up Internet connection.

This feature is best used in small to medium-sized environments of less than 500 users and for companies that want the benefits of running a server with a full news feed but have limited resources for doing so. DNEWS can even use a combination of dynamic and full feeds to give your users the best of both worlds.

DNEWS also bundles a News to Web Gateway called DNEWSWEB that allows users to read and post news directly from their web browsers. DNEWSWEB is actually a CGI script that 'plugs-in' to your web server and makes full text searching possible as well as optional support for secure newsgroups (when used with a secure web server).



TUCOWS

Scott Swedorski

BROWSER SEARCH BOTS

If you are experiencing the rapid-growth characteristic of the Internet industry, you may be finding that there are pressures and concerns you never expected. Copyright infringement might not be a concern when you are a small web site with a few thousand members-but if you grow into an overnight "Net Phenomena," you may find that there are other folks out in cyberspace using your trademarks.

Beyond the emotional frustration, there can be serious implications to such infringement. At least one ISP found its trade name in use by a spam organization. While the company is strongly anti-spam, it has to deal with confusion and misdirected flame mail. "We thought it was funny at first, but we believe it has lead to our domains being banned by a small number of administrators who did not double-check the headers properly," said one of the company's managers.

Clearly, it's a good idea to check up on copyright-infringers on a regular basis, but how do you do that quickly and cheaply in a global marketplace? There are tools at TUCOWS called "Browser Search Bots" that can help you track down offenders. They can also be used as "Super-Search-Engines."

"Who's Talking was designed mainly for corporate use to find violations of copyrights and trademarks," said T. J. Walker, owner of Software Solutions.Net the company marketing Who's Talking. "However, because of its capabilities it is ideal for webmaster's use also."

T.J.'s company has been creative in finding other uses for Who's Talking. "There was a .cgi script available from one of the download sites I could never get to work right. I went to WT and did a search for cc_ver.cgi, and WT found every page on the web using that same script. I visited a few of those pages and saw what I needed to do."

He also suggested using the program to find specific lines of Java script, and to find links back to your sites. Just type in a URL - without the http:// like beherenow.com/spider/index.htm and the program will show you every page out there with a link back to that URL.

Art theft has taken on a whole new dimension on the Web. "We have some pretty neat graphics we have done which end up getting stolen and put on other sites," T.J. said. "We always name our file with odd names-like mainlogo204c4.jpg. A quick search with WT shows us every page on the Net using those graphics."

There are a variety of other programs available well that perform similar functions.

Copernic

| | |
|-----------------|---|
| Version Number: | 1.2a |
| Revision Date: | January 20, 1998 |
| File Name: | copernicsetup.exe |
| Byte Size: | 1,921,222 |
| License: | Shareware (30 Day Fully Functional Evaluation) |
| Cost: | \$29.95 |
| HomePage: | http://www.copernic.com |
| NT Compatible: | Yes |

Copernic is a fully functional, stand-alone search engine that features numerous document handling filters and functions, and excellent indexing and history functions. It offers fast and responsive searches, with the results displayed in a comprehensive, logical manner.

ImageWolf

| | |
|-----------------|---|
| Version Number: | 1.02 Build 006 |
| Revision Date: | January 26, 1998 |
| File Name: | lwolf102.exe |
| Byte Size: | 942,592 |
| License: | Shareware, 200 uses |
| Cost: | \$25.00 |
| HomePage: | http://www.msw.com.au/lwolf/index.html |
| NT Compatible: | Yes |
| Also Available: | Windows 3.x Version |

ImageWolf locates picture and movie files on the Net by crawling web sites. It also explores web rings, looking for files based on a given query. At 28.8 Kbps, ImageWolf can locate thousands of pictures per hour and deliver it all to your browser for display.

Inforia Quest

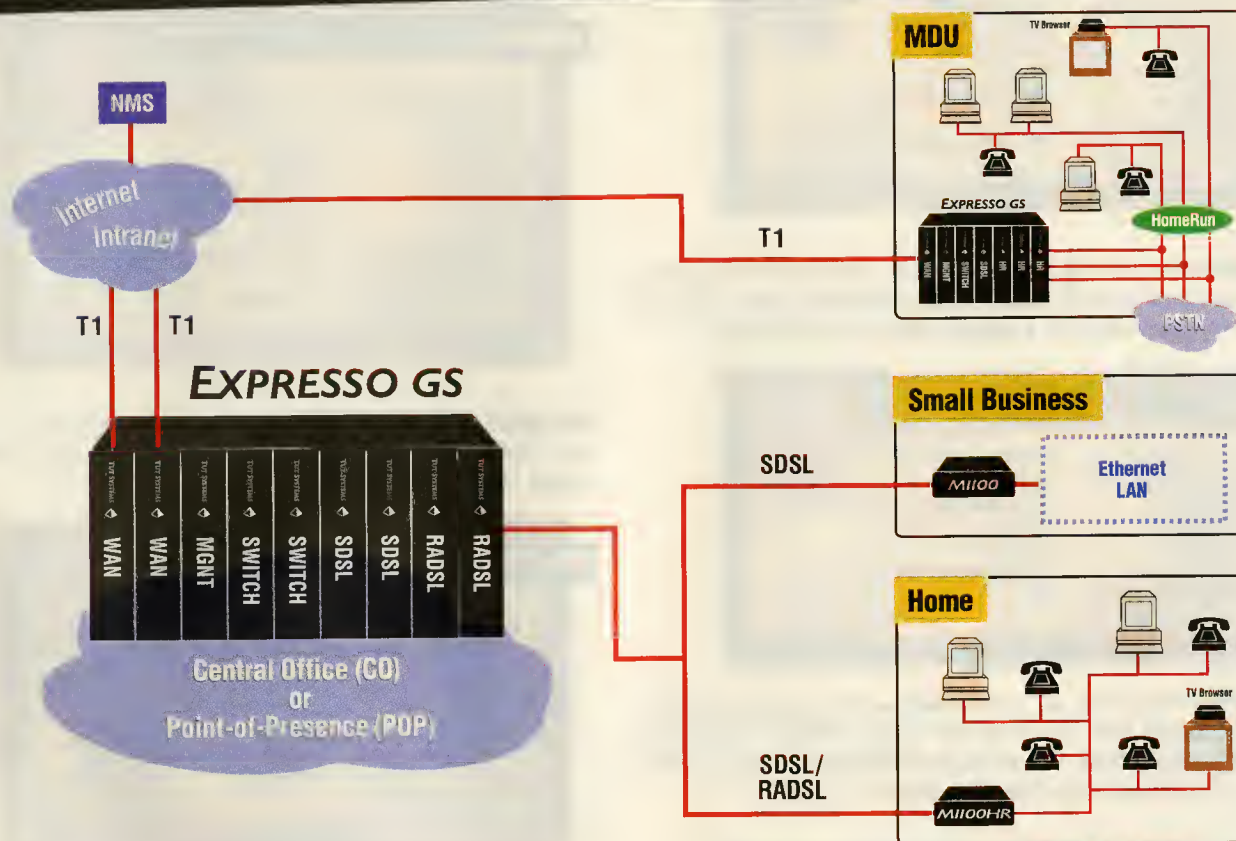
| | |
|-----------------|---|
| Version Number: | 98 1.0ET |
| Revision Date: | January 19, 1998 |
| File Name: | iq98et.zip |
| Byte Size: | 3,351,397 |
| License: | Shareware |
| Cost: | \$19.99 |
| HomePage: | http://www.inforia.com/quest/ |
| NT Compatible: | Yes |

Inforia Quest 98 enables you to submit a search to one or many search engines, Usenet newsgroup

Scott Swedorski is president and founder of TUCOWS, The Ultimate Collection of Winsock Software. He lives in Flint, Michigan with his wife, Vicky and two daughters, Emily and Ashley. After joining the army at the tender age of 17, Scott received his degree in Computer Information Systems from Mott College, and received an Honorable Discharge after eight years service. Scott welcomes input from Internet users and software developers at tucows.com.

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news sites, and FTP sites. Returned information includes the title, URL, a brief listing of contents, and more. IQ can search 100+ search sites simultaneously, and the results can be clicked to view in a web browser or saved to an HTML file.

SearchWolf



| | |
|-----------------|---|
| Version Number: | 2.01 Build 006 |
| Revision Date: | January 26, 1998 |
| File Name: | srchw201.exe |
| Byte Size: | 860,160 |
| License: | Shareware, 200 uses |
| Cost: | \$25.00 |
| HomePage: | http://www.msw.com.au/ |

SearchWolf is an expert system that unlocks the full potential of the major search engines. You can search one, or all the engines concurrently, via a single, easy to use interface.

Web Ferret



| | |
|-----------------|---|
| Version Number: | 1.30001 |
| Revision Date: | January 29, 1998 |
| File Name: | WebFerret13001.exe |
| Byte Size: | 778,240 |
| License: | Freeware |
| HomePage: | http://www.ferretsoft.com |
| NT Compatible: | Yes |

WebFerret will query all configured search engines simultaneously. Results that are returned (often within a second or two) can be acted upon immediately. WebFerret was TUCOWS' winner of the Pick of the Week for March 10, 1997!

Web Bandit



| | |
|-----------------|---|
| Version Number: | 3.01 |
| Revision Date: | February 20, 1998 |
| File Name: | wb210t.exe |
| Byte Size: | 4,626,000 |
| License: | Shareware |
| Cost: | \$99.95 |
| HomePage: | http://www.jwsg.com |
| NT Compatible: | Yes |

A versatile web search utility that uses multiple search engines to retrieve results from the Internet. Also includes the option of saving the results as HTML, text, ASCII, URL's, and E-mail addresses.

WebSeeker


| | |
|-----------------|---|
| Version Number: | 3.3 |
| Revision Date: | January 14, 1998 |
| File Name: | wsw953.exe |
| Byte Size: | 3,505,025 |
| License: | Shareware, 15 day evaluation |
| Cost: | \$49.95 |
| HomePage: | http://www.ffg.com/seeker/ |
| NT Compatible: | Yes |

Combine the results of virtually every major search engine (Yahoo, Lycos, Excite, AltaVista, WebCrawler) into a single, unified search with WebSeeker (TM). With the stroke of a key, ForeFront's WebSeeker, formerly Blue Squirrel's SqURL, runs your information query through more than 20 Internet search engines simultaneously, delivering one of the most comprehensive search reports available.

WebWolf


| | |
|-----------------|---|
| Version Number: | 2.02 Build 004 |
| Revision Date: | January 26, 1998 |
| File Name: | wwolf202.exe |
| Byte Size: | 908,880 |
| License: | Shareware, limited functionality until registered |
| Cost: | \$25.00 |
| HomePage: | http://www.msw.com.au/ |
| NT Compatible: | Yes |
| Also Available: | Windows 3.x Version |

WebWolf is a desktop-based web page crawler. It explores web Rings, and compiles a list of files, FTP sites, and links based on given keywords.

Who's Talking


| | |
|-----------------|---|
| Version Number: | 1.27 |
| Revision Date: | December 3, 1997 |
| File Name: | WhosTalking.exe |
| Byte Size: | 4,033,024 |
| License: | Trialware |
| Cost: | \$99.95 |
| HomePage: | http://softwaresolutions.net/whostalking |
| NT Compatible: | Yes |

Protect your trademarks. Research your competition. Keep track of who's saying what to who and where. More than just a search engine spider, Who's Talking spiders the actual results and reports back to you exactly where the offending trademark, image file, or URL appears on the site. Point Who's Talking at regular meeting places, like stock discussion boards, image archives and personal homepages, and you'll find out about violations before the search engines can even index them.

I suggest you try a variety of Browser Search Bots before settling in on one favorite. They offer slightly different features, and there may be different results depending on the Bot and the criteria you use. Experiment with a variety of settings. Check the web for your own name! I guarantee the results will be interesting. ♦

WAIT LIFTER.

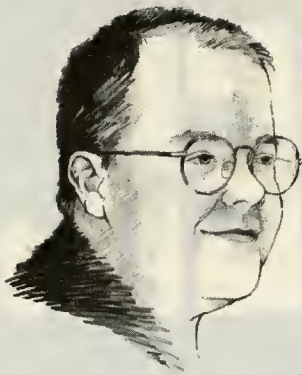


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EURO NEWS

Richard Baguley

NEW POLICE MOVES ON NET PORN

In August 1996, the UK Police sent a letter to all UK ISPs. This letter concerned 133 Usenet newsgroups, which the police claimed contained illegal material (such as pornographic images that are illegal in the UK). The letter threatened legal ramifications if they didn't remove these newsgroups from their Usenet news servers. "As you will be aware the publication of obscene articles is an offence," the letter said. "This list is only the starting point and we hope, with the co-operation and assistance of the industry and your trade organizations, to be moving quickly towards the eradication of this type of Newsgroup from the Internet." You can read the original text of the letter at <http://www.leeds.ac.uk/law/pgs/yaman/themet.htm>. At the time, the police didn't proceed any further with this action, but now it seems that they may be thinking again...

Recently, the police have indicated that they may now be looking to set an example. A senior officer at the Metropolitan Police has been quoted by the BBC as saying, "Those news groups we are talking about are consistently full of child pornography. They only exist to transfer or to make available child pornography. That is against the law. I do not believe there can be any justification for any organization making that type of material available to its customers." You can read the story at http://news.bbc.co.uk/1/english/uk/newsid_60000/60355.stm.

This raises the rather worrying prospect of the police going into the offices of an ISP and seizing their servers as evidence in a possible prosecution — although it's not happened to an ISP, the police have certainly got powers to seize computer equipment, which they think may contain illegal material. They have also had a recent string of successful prosecutions, including one concerning a web site, which was hosted in the US but linked to a UK site. So, they may be looking to make an example by taking legal action against one ISP.

Of course, it could just be a case of the police looking to scare ISPs into cleaning up their Usenet news servers by removing the groups. Although many ISPs have complied, so far a number (including Demon Internet, who many think could be one of the police's first targets) have not removed the groups. In fact, Demon still offers a complete and unexpurgated news feed, claiming that it's not the newsgroups themselves that are the problem, but some material posted to them.

After the first letter was sent in 1996 (with the accompanying media furor), the industry set up a body called the Internet Watch Foundation (IWF, formerly known as SafetyNet). The idea was that this organization (which I've mentioned in previous columns) would act as a clearing house for reports of illegal material. A user would report what they thought was illegal material, the IWF would look at it, and (if they thought it was illegal) advise ISPs to remove it.



The IWF has just released a report on their first full year of operation, where they claim to have received 781 calls concerning over 4,300 items. Of these, they decided that 51 percent were "actionable" (that is, they could be deemed to be obscene under British law). Strangely enough, for a UK based organization, very few of the complaints they received actually came from the UK — only 6 percent. A much larger portion, 63 percent, came from the US, although it is worth remembering that many of these could actually have come from subscribers to services like AOL, which have most of their systems located in the US, thus upsetting the figures. As well as notifying ISPs, the IWF also passes any information on "actionable" items to the National Criminal Intelligence Service (NCIS), a central police coordinating body that could then pass them to the appropriate police force.

IWF UNVEILS PROPOSAL FOR RATINGS

Meanwhile (as mentioned in previous columns), the IWF is also working on a UK ratings system for Newsgroups and Web pages. A draft version of this has recently been published (at <http://www.iwf.org.uk/rating.html>), and the IWF is currently seeking comments on this. It makes for interesting reading — the proposal calls for a system that works on

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He lives in North London and has just completed *Quake II* without cheating, although he's having a bit of trouble with *Dungeon Keeper*. He can be contacted at bagers@bagers.com.

the basis of profiles which define what is restricted and what isn't. These profiles could be based on existing ratings systems, such as TV or film ratings. The draft proposal also claims that the ratings standard "would be open to other specialist interests to develop profiles to meet their own particular requirements, e.g. for Catholic or Muslim Internet users."

Of course, it's all a bit vague at the moment. There is relatively little solid content in the proposal on how the ratings system would work in technical terms (although it would be roughly based on the PICS standard). Interestingly enough, it does acknowledge that a ratings system has to be flexible to actually work: "This system should be based on voluntary rating by content providers, but with a concerted effort by government bodies, Internet service providers and other interested parties to encourage the rating of content according to an agreed system." In other words, the criteria for rating pages could be decided by a particular country or organization, and people would then agree to work with one particular ratings system that they wanted to use. Although it has still got some way to go, there are definitely some interesting ideas in the proposal...

WILL TV BRING THE INTERNET TO THE MASSES?

In terms of interactivity, the TV doesn't exactly compete with the Internet. Sure, you can throw things at it and even shout at it, but you don't usually get much of a reply. However, some people think that the TV is going to be the key to bringing millions of people online...

Their belief is based on devices like WebTV and the UK designed and manufactured Web Station. These devices plug into the TV and the phone line and can be used to browse web sites, send e-mail and generally do most of the things that a PC can do, at a fraction of the cost. What's more, being dedicated slowly to the task of accessing the Internet, they are much simpler than a PC and thus are much easier to make. So (their argument goes), they are cheaper and are going to provide Internet access for the masses who don't need or want a full blown PC...

Not so, says UK-based research company INTECO. Their latest report on growth trends on the Internet in the UK claims that these devices will make a relatively small impact on the UK Internet market over the next few years. They claim that the major area of Internet growth will continue to be people who own PCs, with relatively few of the 99 percent of households who own TVs using them to help them get online.

Their report claims that there are currently around 1.5 million households in the UK accessing the Internet through a PC. They project that this number will rise to 4.6 million by the year 2001, a not inconsiderable increase of over 300 percent. Meanwhile, they estimate the number of people accessing the Internet through TV-based systems will be around 1.3 million, way behind the PC-based figure. The trend is pretty much the same across Europe, with an estimated 3.1 million PC based Internet users in France (a staggering 440 percent increase on the 1997 figure of 0.7 million) and 1.3 million non-PC-based users. Germany also has a similar set of figures, a projected 6.8 million PC-based users and only 1.6 million non-PC-based users.

INETCO claims that these figures (which are, of course, only projections) are because of the fundamental differences between the two markets. PC users are used to and are happy

to pay for information, but your typical couch potato TV user is likely to be less willing to pay either the initial purchase price of the device or the subscription fee. As Adam Daum of INETCO puts it, "Very few consumers will be willing to pay premium subscriptions for access via the TV . . . patterns of teletext use show the willingness to interact goes beyond PC households, but the ability and willingness to pay become weaker. Non-PC households will pay for entertainment, but in general are far more resistant to paying for information . . ."

Of course, 1.3 million users in the UK alone isn't to be sniffed at, but it represents a rather small percentage of users of the Internet in general. How many web sites are likely to be willing or able to limit their content to the systems supported by these devices, when they can do much fancier and more interesting content for the people using PCs? While web site authors can create individually tailored pages for the different platforms, how many are going to be willing to fork out the extra expense for such a small market?

Having used a few of these devices myself, I'm tempted to agree with INTECO. Although they do provide Internet access in a relatively simple and cheap fashion, they are somewhat limited. The fact that they are dedicated means they can't do many of the things that a more powerful PC can, like playing networked games or running Java applets to do some of the cleverer stuff on the Web. However, I'm hardly the target audience for these devices — I know how PCs work and how to get them to do what you want (although I have been known to shout at them occasionally). Some people may be willing to put up with the limitations that they impose, but I'm not convinced that there will be enough to create a sizeable chunk of the market . . . ♦

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BIG BOARD BRIEFS by Wallace Wang

AOL RAISES MONTHLY FEE TO \$21.95

Citing increased demand, American Online announced that the subscription fee for unlimited accounts will be raised by \$2 to \$21.95. "Our expanding membership and surging usage confirm that consumers want the content, services, features and ease of use that are uniquely AOL," said AOL Chairman and Chief Executive Officer Steve Case. Not to mention busy signals, e-mail outages, and service shutdowns as well.

America Online claims usage has tripled since offering their unlimited, flat-rate subscription plan. Before the flat-rate plan, the average AOL user stayed online for 7 hours each month. After the introduction of the flat-rate plan, that figure jumped to 23 hours per month.

"Each additional minute our members spend online adds to our cost of delivering unlimited-use service. Revenues from advertising, commerce and other sources continue to grow as anticipated, but are not yet able to cover the growth in member usage," Steve Case said.

America Online's other monthly pricing options remain the same. If you already have an Internet provider, you can get unlimited connect time to AOL for \$9.95 a month. For casual users, you can subscribe to the low-level usage plan for \$4.95 a month, which includes three hours of connect time, with each additional hour costing \$2.95.

PRODIGY OFFERS \$15.75 A MONTH PLAN

Following America Online's announcement that their new monthly unlimited usage fee will increase to \$21.95, Prodigy has announced a new 1-Year Discounted Plan that represents a discount of almost 30% off AOL's new price. To qualify for this new plan, just prepay your membership one year in advance and you'll get 12 months of unlimited Prodigy Internet for the equivalent of only \$15.75 a month.

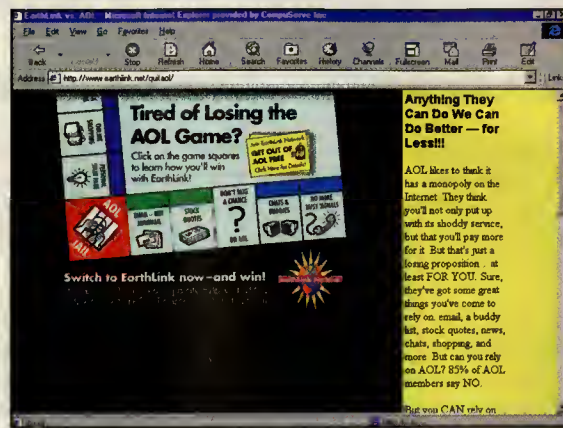
Prodigy might convince some of America Online's members to defect with this pricing plan but it won't likely make a dent in AOL's growing membership. America Online spends millions trying to reach the consumer market. When was the last time you saw any advertisement from Prodigy?

EARTHLINK TARGETS UNHAPPY AOL MEMBERS

Prodigy isn't the only Internet provider trying to capitalize off America Online's \$2 price increase.

EarthLink has launched a new program, called "Get Out of AOL Free."

"AOL just raised the price of inferior service. We're sticking to our \$19.95-per-month pricing, and we'll continue to welcome new AOL graduates to the EarthLink family," said EarthLink Chairman Sky Dayton.



The company set up a Web site at www.earthlink.net/quitaol as well as a toll-free number (888-QUIT-AOL) to make it easy for unhappy AOL members to make the switch. To learn more about this program, visit EarthLink at www.earthlink.net.

SIGN A FRIEND TO AMERICA ONLINE, GET \$20

With Prodigy, EarthLink, and other Internet providers trying to steal customers from AOL, America Online has launched a new program to help you convince your friends to sign on with AOL. For each person you sign up, America Online will pay you \$20.

The only condition is that each person who signs up stays with AOL for at least 90 days and subscribes to AOL's unlimited pricing plan (\$21.95). AOL promises to pay for up to 12 referrals per month, so if you can convince enough people to join AOL, you can essentially be using AOL almost for free.

COMPUSERVE OFFERS TEL-SAVE LONG DISTANCE SERVICE

After bombarding America Online users with long distance advertisements, Tel-Save has signed a contract to provide long-distance phone services to CompuServe members. Tel-Save will receive advance

Wallace Wang is the author of *CompuServe For Dummies*, *Visual Basic For Dummies*, *More Visual Basic For Dummies*, *Microsoft Office 97 For Dummies*, and *More Microsoft Office 97 For Dummies*.

When not working with computers, he performs stand-up comedy and has appeared on A&E's *Evening at the Improv* TV comedy show. He can be reached via e-mail at 70334.3672

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payments of about \$14 million over the next 18 months, Tel-Save Chairman Dan Borislow said.

Tel-Save estimates that 1.8 million CompuServe subscribers will be using its long-distance services by the end of 1998, Borislow said. The cost of Tel-Save's long distance services is 9 cents a minute. Tel-Save also plans to provide local phone service eventually and hopes to use its America Online and CompuServe subscriber base to break into those markets too.

MORE USERS AND MARKETING CUTS BOOSTS AOL'S SECOND-QUARTER PROFIT

America Online reported second-quarter earnings of \$20.8 million, or 17 cents per diluted share. Revenues for the quarter ended Dec. 31 rose to \$592 million, an increase of 45 percent over the same quarter last year. That compares to a net loss of \$129.1 million, or \$1.37 per share, on revenues of \$409.4 million for the same period a year earlier.

The profits come from a combination of increased membership, advertising and electronic-commerce plus cutting marketing spending by more than half. AOL members now pay on average about 80 cents per hour of usage, compared to about \$2.40 per hour a year ago before the company began offering flat-rate pricing, according to Bob Pittman, president and chief operating officer of AOL.

Nearly 1.3 million new members joined the online service during the second quarter, increasing the total membership to more than 11 million. On a daily basis, AOL said it handles 26 million e-mails to 90 million recipients, as well as 200 million instant messages, during more than eight million hours of usage.

Of course, America Online can only make so many marketing cuts and if their phenomenal membership growth slows at any time, look for their absurdly priced stock to take a fall in a hurry.

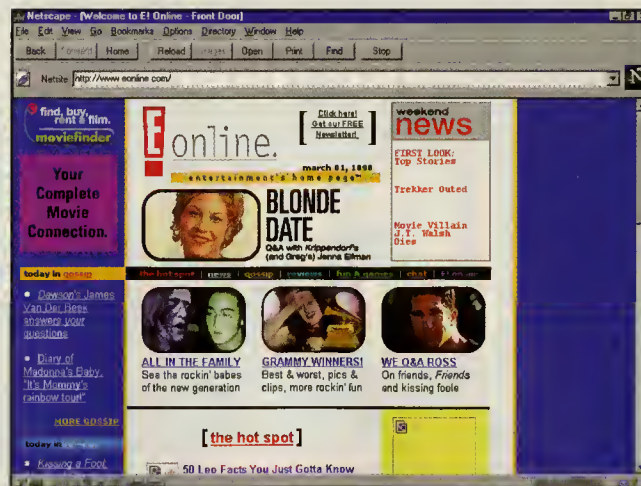
AMERICA ONLINE BRANCHES INTO HONG KONG

Hong Kong-based China Internet Corporation (CIC) and America Online have announced a deal to bring America Online to the Hong Kong market. The AOL service, to be launched within the next year, would be augmented with local content in Chinese and English.

CIC is currently responsible for building the China Wide Web, an online business that spans China and provides business information, collaboration and communications systems. CIC will work with America Online to provide the local content for the Hong Kong AOL service along with local support services. Since both China and America Online have a history of censorship, perhaps this could be a perfect match between government and private industry.

AOL INKS DEALS WITH INTUIT, E!, AND THE AUDIO BOOK CLUB

In their continuing effort to sign up high-profile advertisers, America Online signed deals with Intuit and the E! cable television network. Intuit, the maker of Quicken financial software, will pay \$30 million over three years, including \$16 million up-front for prime positioning on AOL. Intuit will be the primary provider of personal finance content on AOL's Personal Finance channel and the anchor tenant in the Personal Finance and Workplace channels on America Online.



AOL's deal with E! Entertainment Television makes E!'s Web site (www.eonline.com) an anchor tenant on AOL's Entertainment Channel. "AOL delivers massive traffic, and they have the right demographics for our target audience," E! Online President Jeremy Verba said. "We want E! Online to be in front of people wherever they are accessing content."

Finally, America Online has inked a deal with the Audio Book Club, an online storefront and book club, that will appear on AOL's chat areas and NetFind search engine, along with its Shopping Channel on both the AOL service and the AOL.com Web site.

AOL users will be able to sample audio clips from the Audio Book Club's library of 65,000 titles and receive e-mail updates on their favorite authors, along with reading reviews of new books on tape. With the Audio Book Club on AOL, this may be the first bookstore open 24 hours a day that doesn't require a picture ID to visit.

MSN CANCELS ONSTAGE CHANNEL

After wasting millions of dollars trying to convert MSN into a bad TV channel, Microsoft has canceled its original entertainment programming in MSN's OnStage channel. Programs to be cut including Cinemania Online and Music Central.

"Our research shows that with the exception of games, pure entertainment is not what people find most valuable on the Web," Laura Jennings, vice president of MSN, said. "What they're looking for are tools and services that enable them to get everyday things done faster and more easily on line."

The changes do not affect content for cable television network MSNBC, Microsoft's Slate online magazine, Sidewalk city guides or Internet Gaming Zone. Microsoft said it will focus on practical services, including its Expedia.com travel service, and online advice in CarPoint and Microsoft Investor.

In yet another effort to find a clue how to market their online service, Microsoft plans to launch Microsoft Internet Start, a site that will be the hub of Microsoft Network online services, which will include a Web search engine and e-mail. If Microsoft really wanted to make MSN competitive, maybe they should get rid of their content altogether and just buy America Online.

THERE ARE ENOUGH COMPLEXITIES IN LIFE. CONNECTING TO THE INTERNET SHOULDN'T BE ONE OF THEM.

Creating an Internet presence can be a frustrating experience, even for the expert. Beyond the web server there are routers to make the connections, FTP to move the files, and e-mail servers to give your mail a home. And don't forget the Domain Name Server that's required so the world can know your name. Even after you gather all the pieces, you still have to integrate them. And the costs, in time and money, can be staggering. But now there is an easier way.

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The IPAD's capability is housed in a rack-mount chassis of battle-ready construction. Its custom software, optimized for the Pentium processor, yields an unprecedented combination of performance and durability that you can never get from a general purpose operating system. The IPAD may be easy to use, but it's no toy.



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| Configuration Time | Pre-configured | 5-30 hrs |
| Configuration Cast | — | \$615 Avg |
| Sub Total | — | \$1510 |
| Web Server | Included | Included |
| Configuration Time | Pre-configured | 3-25 hrs |
| Configuration Cast | — | \$490 Avg |
| Sub Total | — | \$490 |
| FTP Server | Included | Included |
| Configuration Time | Pre-configured | 1-2 hrs |
| Configuration Cast | — | \$50 Avg |
| Sub Total | — | \$50 |
| ONS Server | Included | \$495 |
| Configuration Time | Pre-configured | 5-80 hrs |
| Configuration Cast | — | \$1600 Avg |
| Sub Total | — | \$2095 |
| E-Mail Server | Included | \$580 |
| Configuration Time | Pre-configured | 10-100 hrs |
| Configuration Cast | — | \$1900 Avg |
| Sub Total | — | \$2480 |
| Support Costs Per Year | \$795 | \$2100 |
| | Includes Hardware and Software Protection | No Hardware or Software Protection |
| Number of Vendors | 1 | 5 |
| Total Cost | \$8260 | \$13600 |
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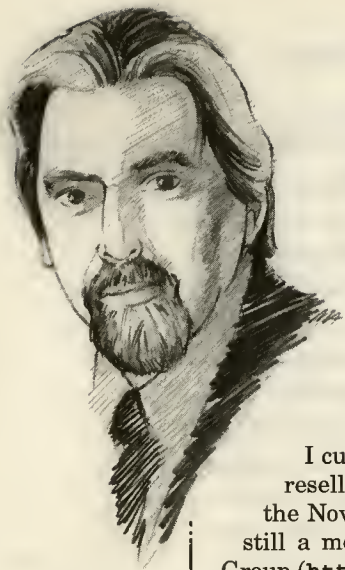
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@INTERNET by Thom Stark

MULTICAST YOUR FATE TO THE WIND

I have a soft spot in my head for L(<http://www.novell.com/>) Novell Corporation.

I cut my networking teeth with a Novell Gold reseller, back in the days when nobody outside the Novell channel had ever heard of CNEs. I'm still a member of the San Francisco Novell User Group (<http://www.sfnug.org/>) and I occasionally attend Novell's local dog-and-pony shows.

That's how I found myself chatting with Eric Schmidt, (<http://www.novell.com/corp/bio/eschmidt.html>) Novell's still-relatively-new Chairman and CEO yesterday afternoon. Schmidt came to Novell from Sun Microsystems, where he was chief technology officer. Before he joined Sun, he was a researcher at Xerox's PARC facility—the cradle from which sprang the whole microcomputer revolution. The man has credibility with a capital C. At Sun, he was the guy who financed and protected the band of believers that created Java and thereby sparked an entire industry. He's as Internet-savvy as any software executive on the planet and he's been paying a lot of attention to network bandwidth issues lately.

Schmidt was in town to show Novell's latest dog-and-pony to important customers and I wormed my way into his talk and the wine-and-cheese mixer that followed because I wanted to brace him up about Novell's hopelessly inept marketing strategies. We got around to talking about the explosion in Internet traffic and then Schmidt casually dropped a statistic that absolutely floored me.

He pointed out that, in February of this year, the PointCast Network (<http://www.pointcast.com/>) passed the one terabyte-of-data-per-day milestone.

Just think about that figure for a moment. That's one trillion bytes of Internet traffic generated in a single day BY A SINGLE SITE.

I'm usually a pretty tolerant guy, but I think that's utterly obscene.

The reason that PointCast is such a giant, snorking bandwidth pig (and it's a problem that virtually all current consumer-oriented "push" services share) is that its content distribution is based on a unicast connection model. No matter how much of PointCast's content is redundant to any given subset of its subscribers, each of them must make a separate IP socket connection in order to receive it. And that's an incredibly extravagant use of Internet bandwidth.

Suppose two of your subscribers may have the exact same PointCast preferences. For instance, they might both want CNN, the *San Jose Mercury News*, sports and their horoscopes and California Lotto results. Even though the content they've subscribed for is identical in every respect, they each have to initiate separate TCP/IP socket sessions in order to receive it. That's a 50% waste of bandwidth.

Now multiply those two subscribers' redundant data by two, three, five or perhaps 10 million PointCast subscribers and you begin to see the dimensions of the problem. The unicast model is just sinfully wasteful of bandwidth for highly-redundant content, such as PointCast's.

Which is why I immediately thought of IP multicasting.

DON'T KNOW MUCH ABOUT HISTORY...

IP multicasting is based on the fundamental ideas put forward by Steve Deering (who, as it happens, is also largely responsible for shepherding the IPv6 development process through to a completed standard). In December, 1985, while he was still at Stanford University, Deering and David Cheriton co-authored RFC 966, "Host Groups: A Multicast Extension to the Internet Protocol" (<http://www.cis.ohio-state.edu/htbin/rfc/rfc966.html>), which first proposed a multicast extension to the Internet Protocol, described Class D addressing (the set of addresses reserved for IP multicasting) and laid the foundation of today's IP multicasting technology. The following year, Deering refined that proposal in RFC 988, "Host Extensions for IP Multicasting" (<http://www.cis.ohio-state.edu/htbin/rfc/rfc988.html>), which specified version 0 of the Internet Group Management Protocol, the extension that permits IP multicasting to work its magic.

Deering's 1988 RFC 1054, "Host Extensions for IP Multicasting" (<http://www.cis.ohio-state.edu/htbin/rfc/rfc1054.html>), and RFC 1075, "Distance Vector Routing Protocol" (<http://www.cis.ohio-state.edu/htbin/rfc/rfc1075.html>), which he co-authored with Craig Partridge and David Waitzman, incrementally advanced the state of the multicast art. Then, in 1989, Deering authored yet another version of "Host Extensions for IP Multicasting," RFC 1112 (<http://www.cis.ohio-state.edu/htbin/rfc/rfc1112.html>), which, as of this writing, is still the definitive document on the subject.

In a nutshell, Deering's brainstorm was to define a set of IP addresses (which range from 224.0.0.0 to

Thom Stark is President of STARK REALITIES, a consulting firm based in the San Francisco Bay Area, which specializes in integrating Internet-native technologies into existing business, networks. He also conducts seminars and tutorials about the Internet at trade shows and for business and user groups. He is the author of the serialized online science fiction novel, *A Season in Methven*, (<http://www.starcrealities.com/Methven/>). Mr. Stark maintains a non-commercial web site, which focuses on IP internetworking technologies and policy issues at <http://www.starcrealities.com>, and his e-mail address is thom@starkrealities.com.

239.255.255.255) that could be assigned to multiple hosts concurrently, unlike standard Internet addresses, which must be globally unique. A multicast host is simultaneously assigned not only its "standard," exclusive IP address, but also Class D addresses, one of which must be the all-hosts address, 224.0.0.1, while the other(s) may include zero or more addresses from the range 224.0.0.2 to 239.255.255.254, each of which represents a distinct multicast group. It may be a member of any number of multicast groups simultaneously and may dynamically join or leave groups (adding or dropping Class D addresses to itself) via IGMP messaging.

Of course, this means that any multicast-capable host must be capable of supporting multiple virtual IP interfaces on the same physical network interface. Since all new Ethernet cards do so (and so do the Windows 95 and Windows NT 4.0 dialers), that's only an issue for older network cards.

The beauty of IP multicasting is that, like IP broadcasting, it allows an arbitrary number of hosts to receive a single data stream, while, unlike broadcasting, it permits those hosts that do not wish to receive the data stream to ignore it. That means, for example, that a virtually unlimited number of IP multicast users can "tune in" to a single video data stream, instead of the video server needing to make a separate socket connection and send a separate data stream to each subscriber.

Oh, but wait, there's more: although most industry and general press stories about multicast present it as the Internet equivalent of television or radio broadcasting (i.e. a one-to-many data distribution system), by default, any member of an IP multicast group can transmit to the group as a whole. That changes the distribution paradigm from the one-to-many exemplar to a many-to-many model. In other words, rather than TV or radio, native IP multicast more nearly resembles CB radio, instead. Multicast groups are roughly equivalent to CB radio channels and, like CB, all multicast group members can originate, as well as receive transmissions.

And that many-to-many, bandwidth-efficient model is a compelling one for folks who work in highly-collaborative environments.

THE MBONE'S CONNECTED TO THE BACKBONE

Like the World Wide Web, the Mbone (or Multicast Backbone) is essentially a creation of the high-energy particle physics community. The particle physics boys get to play with *really* expensive toys—colliders, like the Stanford Linear Accelerator (SLAC), to help them search for ever-more-elusive new particles, terawatt lasers for controlled nuclear fusion ignition research and Class C rooms crammed to the walls with supercomputers and terabyte disk farms. They also tend to deal in pretty serious imaging applications and, in order to support collaborations between research facilities, they need serious bandwidth for the insane quantities of data with which they deal.

Even so, their pet computer scientists are always looking for ways to foster better collaboration, and more efficiently use the considerable data networking resources with which your tax dollars endow them. The need to provide a friendlier and more transparent data interface drove Tim Berners-Lee to develop the World Wide Web for the folks at CERN—the European Laboratory for Particle Physics. Likewise, the desire to enhance collaborative tools, such as real-time video conferencing over existing data networks, led to the implementation of basic Mbone technology (<http://www.mbone.com/>) by Steve

Casner, then at USC's Information Sciences Institute, of an assortment of basic Mbone collaborative tools (<ftp://ftp.ee.lbl.gov/conferencing/>) by Van Jacobson's Network Research Group at Lawrence Berkeley National Laboratory, and of multicasting kernel patches (<http://www.mbone.com/mbone/kernel-patches.html>) and software (<http://www.cs.unc.edu/~wangx/MBONE/mbonetoolarchive.html>) by researchers around the world.

The demonstration platform they created rapidly evolved from a curiosity to a heavily-used collaborative environment. It's been used for everything from monitoring space shuttle launches to providing real-time "over-the-shoulder" consultation by U.S. heart specialists to Russian cardiac surgeons working on live patients in the operating room. In the process, the Mbone community has uncovered a host of unforeseen complications and an equally-large array of equally-unanticipated applications for IP multicast technologies. And, naturally, they've been hard at work trying to solve the knottier problems—with a fair degree of success.

DO YOU KNOW THE WAY TO SAN JOSE?

The most complex stumbling blocks in the multicast sphere lie in the arena of routing (<http://www.ipmulticast.com/community/whitepapers/intorouting.html>).

The original model assumed that every multicast-enabled network would be lousy with subscribing hosts and that it had bandwidth to burn. This so-called "dense-mode" assumption in turn resulted in the original multicast routing model, which used a technique called "flood and prune" to build a spanning tree. Announcements of available groups (propagated via the mandatory-subscription all-hosts 224.0.0.1 address), and the data streams for those groups, would simply flood the network, much like an actual broadcast transmission. Then, as subscription responses were received by the originating host, those network segments that had no subscribers would be pruned—which is to say the routers that connected those segments to the larger network would be told not to transmit data streams for multicast groups with no subscribers on that segment.

That model worked fairly well in the hothouse climate of the Mbone, and various routing protocols—beginning with Distance Vector Multicast Routing Protocol (DVMRP), continuing with Multicast Open Shortest Path First (MOSPF) and culminating in the more recent Protocol Independent Multicast-Dense Mode (PIM-DM)—were developed based on the dense-mode paradigm. Unfortunately, out in the real world of the Internet, bandwidth is often seriously constrained (even a fully-bonded, dual B-channel ISDN connection is an anorectically-thin pipe by Mbone standards) and, at least for the moment, the population of multicast-enabled clients is anything *but* dense. Another approach to the routing problem was needed if IP multicast was ever going to be able to scale to fit the Internet environment.

The first alternative multicast routing protocol to be predicated on more realistic assumptions about user density and available bandwidth was known as Core Based Trees (CBT). It changed the model from the original negative-option, data-driven one (basically, "You get this data stream unless you tell me you don't want it"), to a subscriber-initiated one ("You can have this data stream if you tell me you want it"). It also allows any CBT-based router between a multicast source and a new group member to acknowledge a join request—which cuts way down

on superfluous ACKs. A still newer approach—Protocol Independent Multicast-Sparse Mode (PIM-SM)—offers both increased flexibility and the promise of a single, interoperable standard for both dense and sparse modalities.

All of these protocols are steaming down standards tracks, but PIM (<http://netweb.usc.edu/pim/>) looks like the horse to beat.

AND, OF COURSE, HARRY THE HORSE DANCES THE WALTZ!

The Second Annual IP Multicast Summit (<http://www.ipmulticas.com/events/summit98/ipmi-summit98.htm>) was held February 8-10 in San Jose, California. You can always tell when a technology is about to take off like a bat out of Bosnia, because the geeks give way to the snake-oil salesmen. That's exactly what happened at the Doubletree Hotel this February. Last year, every panelist and every presenter had his or her propeller whirling at turbofan speeds. (Well, okay, the Microsoft presenter gave a pure product marketing talk—but he was pretty much the only exception to the rule.) The acronyms flew like volleys of birdshot and the attendees' standard of sartorial elegance was running shoes and pocket protectors.

This year, on the other hand, it was hype that filled the air and the dress code ran to tasseled loafers and power ties. None of the marketeers brought handouts, of course, and it seemed to me that everyone got into the marketeering act.

The UUNET presenter, who was scheduled to talk about implementing IP multicast in a real-world environment, instead pitched the multicast tunneling service for which UUNET charges its customers outlandish prices. His presentation wasn't about *technology* it was about a *product*.

The Bobbsey Twins from Real Networks and Microsoft were even less shy about grinding out propaganda for their respective enterprises.

Forty-five minutes of content-free pitches for Real servers and NetShow was thirty minutes too much for me. I had to escape and seek the company of engineers.

Luckily, I stumbled over the very anodyne I was after, as the engineers in question abandoned the same sorry presentation I'd just quit. In short order, I learned that every internal router in MCI's network runs PIM-SM and that MCI is far from alone in quietly implementing IP multicast in the real world of commercial ISPs. At least four other network engineers were party to that ad-hoc discussion, all of them employees of ISPs of various sizes. They're *all* running multicast and they're all running PIM-SM.

That's not all. The Multicast Summit featured an actual exhibit floor—an attraction it was unable to muster last year. It was small, as were all the booths, but at least it was there, and it featured real vendors with real multicast-based products for sale. Now, it's true that nearly half of them were streaming video product—a market niche that I suspect will turn out to be too small to let all those folks become millionaires—but I saw some really innovative and useful non-video services, too. And all of them were based around reliable multicast.

HEY, BULLDOG!

Reliable multicast is darned important because IP multicast is *not* reliable by default. Much like UDP-based applications, standard multicast drops packets on the floor, instead of suffering the performance decrement that negotiating retransmission would incur. That makes it unsuitable for content-sensitive applications, such as file distribution.

At one end of the spectrum, there's GlobalCast Communications (<http://www.gcast.com/>), which is hoping to use its partnership with Cisco to leverage a hitherto-proprietary suite of protocols for reliable multicast—Reliable Multicast Protocol, (RMP), Scalable Reliable Multicast (SRM) and Reliable Multicast Transport Protocol (RMTP)—into Internet standards. Other than those protocols and their common API, it has no products, *per se*, but GlobalCast plans to make money licensing its protocol suite to developers for use in their own offerings.

At the other end of the spectrum, StarBurst Communications (<http://www.starburstcom.com/>) uses its patented (and proprietary) Multicast File Transfer Protocol (MFTP) in a family of Sun Solaris, DEC Unix, SCO UnixWare, OS/2 and Microsoft Windows-based server and client products to enable its customers to distribute software and data to a large number of hosts simultaneously. Its customers include both GM and Ford, who use StarBurst's products; to send software updates respectively to 8,500 General Motors' dealerships and to more than 6,000 Ford dealerships in North America.

DO THE MATH

If 6,000 Ford dealerships, for instance, need 10 megabytes worth of data updates per day—not an unreasonable figure if you think about inventory, availability and pricing changes for that many cars—a unicast distribution system would need to move *60 gigabytes of data every day*. Because Ford uses IP multicast via a satellite distribution system, it only needs to transmit *10 megabytes* of data per day.

I thought that might get your attention.

Now, of course, Ford doesn't *really* get away with a mere 10 megabytes a day. Because it has to retransmit dropped packets (and only dropped packets) to individual dealerships after the general multicast distribution concludes, it actually winds up sending on the order of 60 megabytes per day, instead. That still saves Ford a mere three orders of magnitude worth of data transmission.

I'D LOVE TO CHANGE THE WORLD

Now let's return to the subject of the PointCast Network and its obscene waste of Internet bandwidth. If Ford's experience is any guide, adopting a multicast distribution model could potentially slash PointCast's bandwidth requirements from a terabyte-per-day to no more than a gigabyte-per-day. And PointCast has nearly three orders of magnitude more subscribers to service than does the Ford dealership network, so the actual reduction in PointCast's traffic could well be as much as *four* orders of magnitude.

Maybe more.

So, what's the holdup? How come PointCast hasn't swapped over to multicast distribution months ago?

Chances are, it's partly your fault.

Until IP multicast is ubiquitous throughout the Internet (and, mind you, I'm not talking about UUNET's brain-damaged multicast tunneling here—I'm talking about the real McCoy), PointCast *can't* switch to multicast distribution. Given the multipath nature of the Internet, and the hit-or-miss implementation of IP multicast, there'd be no guarantee that PointCast's subscribers would get their sports scores and CNN headlines, period.

So, here's what you can do to help alleviate the Internet's PointCast-induced suffering and, in the process, provide your customers with access to another world's worth of cool, useful and entertaining applications:

Enable IP multicast on *your* routers and servers.

Between the IP Multicast Initiative web site and the Mbone web site, there's more than enough information out there for you to upgrade your systems to han-

dle multicasting. Use PIM-SM and you'll help create a de-facto standard in the process. You'll discover that Cisco's IOS version 11.3.x can handle multicasting (http://www.cisco.com/univercd/cc/td/doc/product/software/ios113ed/113ed_cr/np1_c/1cmulti.htm) and it's a safe bet there's an OS patch that will safely let your servers understand multicast, too.

If your upstream provider doesn't support IP multicasting, lean on it to start. Offer to accept a tunneled feed until your provider is confident enough to implement native multicasting.

Your users will thank you. Eventually, you'll congratulate yourself on your wisdom and foresight. And the Internet as a whole will benefit, not just because we've all joined together to help slay the PointCast bandwidth dragon, but because the solution to that problem will simultaneously solve a host of similar problems and enable an even larger collection of new technologies and products that we can't yet even imagine because they need ubiquitous multicast.

The revolution will not be televised. But it just might be multicast. ♦

Take Control.

The screenshot displays the 'Customer Service' window of the ISP Power software. It includes fields for Customer ID, Name, Status, and Company. Below these are tabs for Billing, Info, Services, A/R, Events, and Usage. The 'Billing' tab is active, showing a table of transactions with columns for Date, Description, Amount, and a 'Display' button. To the right of the table are buttons for 'Collection', 'Charge', 'Payment', and 'Adjustment'. At the bottom, there are sections for 'Credit Card' (with fields for Card Type, Account Number, and Expiration Date), 'Bank Account' (with fields for Bank Name, Account Number, and Account Type), and 'Billing' (with fields for Bill Type, Contact Method, and Billing Cycle).

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WIRELESS Data Developments by Steve Stroh

PROJECT ANGEL UPDATE: MICROSOFT AND OTHERS WILL WEIGH IN ON WIRELESS HOME NETWORKS

In the March 2, 1998 issue of *Wireless Week* magazine (<http://www.wirelessweek.com>), there was an update on AT&T's Project Angel titled "Armstrong Firm On [Project] Angel Deadline." I wrote about Project Angel in my April 1997 "Wireless Data Developments" column, shortly after AT&T went public with it.

Project Angel is a project by AT&T Wireless to develop a new fixed wireless telephone and data system that would allow AT&T to offer residential telephone service and Internet access without involving telephone wiring owned by an Incumbent Local Exchange Carrier (ILEC).

The high recurring costs of leasing telephone circuits from ILEC's have made it unprofitable (to date) for AT&T to offer residential telephone service. Project Angel is breaking new ground in the field of fixed wireless telephony because it is not derived from current mobile cellular/PCS technology, and is designed to work in one of the "narrow" (10 MHz) PCS bands recently auctioned by the Federal Communications Commission.

Project Angel's first trial was in the Chicago area in late 1997, and those tests have apparently gone very well. One problem is that the current cost of the residential portion of the system is too high, and AT&T Chairman Michael Armstrong isn't relying on assurances that cost reduction will happen in the normal course of development.

Remember that Armstrong is the former chairman of GM Hughes Electronics, the company that developed the DSS Satellite System—it's certain that Armstrong understands the issue of cost-reduction of wireless digital technology to consumer price points VERY well.

AT&T Wireless Services Inc. Executive Vice President Nick Kauser said that it will be possible to substantially reduce the cost of the Project Angel technology, and that it will likely become commercially available in early 1999. I intend to follow developments in Project Angel closely.

MICROSOFT AND IN-HOME NETWORKING

Also in the March 2 edition of *EE Times* (<http://techweb.cmp.com/eet>) there was an article by Rick Boyd-Merritt titled "Microsoft To Broker

In-Home Networking." Microsoft has apparently reached the conclusion that when high(er) speed Internet access finally does reach the home, the next hurdle will be to distribute it *within* the home, and current efforts to come up with in-home networking standards might need that "special Microsoft touch" to reach consensus and critical mass.

Microsoft projects that there will be several techniques to distribute high(er) speed data within the home, including using the existing electrical wiring, cable TV wiring, telephone wiring, or new wireless systems. A hub of some kind will be needed, which Microsoft will build on a stripped-down version of Windows NT or Windows CE.

I believe that Microsoft is partially right, and a "guiding hand" of a vendor with the enormous market clout of Microsoft could make in-home networking actually happen quickly. But for several reasons, I think that Microsoft may be in for a bit of a wild ride with this particular branch of PC technology.

IN-HOME NETWORKING OPTIONS

From my early training as an electronics technician, I just cannot quite bring myself to believe that data can be reliably and inexpensively transferred at reasonable speeds over the wide variety of electrical wiring systems that exist in homes. This is especially true when you consider the wide variety of Earth ground connections.

There is just so much electromagnetic "junk" floating around on the power lines of the average home. I rate the possibility of using existing power lines within homes to transfer data reliably and inexpensively as slim to none, and worst of the four potential techniques described above.

Another possibility is making use of Cable TV wiring to transfer data reliably and inexpensively within a home (quite distinct from the "Cable company as ISP" connections). Again, my training and observations do a severe reality check.

CATV connectors are often poorly installed, multiple signal splitters are used (often splitters are used in series with other splitters), and there's the specter of the dreaded do-it-yourself modifications (the sales-droid at Radio Shack told me "Oh sure—it'll work fine, it's easy to do it yourself"). There are also likely to be *all kinds* of weird gadgets connected to the Cable TV lines, causing the dreaded "impedance lump."

Steve Stroh's first exposures to wireless data and networking resulted from experiences with Amateur Packet Radio (callsign N8GNJ), and later TCP/IP on Amateur Packet Radio using Phil Karn KA9Q's NET and NOS implementations of TCP/IP for DOS PCs. Steve is active in TAPR—Tucson Amateur Packet Radio (<http://www.tapr.org>) and is a founding-member and a member-at-large of the Puget Sound Amateur Radio TCP/IP Group (<http://www.strohpub.com/psartg>). Professionally, Steve is a system administrator. Steve maintains a web page related to his columns at <http://www.strohpub.com/boardwatch>. Steve runs a mailing list to discuss wireless data and networking. To subscribe, send an e-mail to: majordomo@mail.inglist.net, and in the body of the message (no subject needed) put: subscribe wireless-data.

Steve lives in Woodinville, Washington, with his wife Tina and daughter Merideth. He can be reached via e-mail at mailto://steve@strohpub.com.

But the most damning problem of all is that existing Cable TV jacks aren't likely to be where they need to be to connect multiple computers within the home. I rate this potential technology as "better than power lines, but still unlikely."

Yet another potential technique is to use telephone wiring that's in place, within a home, for data transfer. I'm not doubting the technology itself, but having seen some truly *bad* telephone wiring jobs, I'm skeptical the technology can necessarily overcome the worst of the telephone wiring (in fairness, I've created a few of these "home telephony nightmares" myself in my teenage years, before I had any real idea of what I was doing—they worked for voice, though).

Ironically, it's very cheap to wire a home reasonably well for data and phone by using decent data-grade cable and "home-running" the cabling to a central point, especially when there are exposed walls. Yes, it's slightly more expensive to terminate the cables at a punch down block, but that's a trivial expense compared to adding network wiring later.

It's surprising to me that high-end, home construction companies haven't (as far as I'm aware) begun offering data-grade, home-run communications wiring as an extra-price option. As with Cable TV, existing telephone jacks aren't likely to be where they need to be to connect multiple computers within the home. I rate this potential technology as "most promising among in-place wiring, but still unlikely."

All of the above techniques have been demonstrated in lab conditions, and perhaps some field trials. However, Cable TV and telephone jacks aren't ubiquitous within the average home, so if you must add new wiring anyway, you might as well spend a

few extra dollars and have data-grade wiring installed in the appropriate places and have it over with. And that's probably what would happen if there weren't any better alternatives. But there is a better alternative—Wireless!

ONCE AGAIN, WIRELESS SAVES THE DAY!

I feel that the three options I described above for creating an in-home network simply don't compare very well with the option of using wireless technology for transferring data within a home. Wireless could be very cheap and inexpensive given sufficient volume to drive down the prices—900 MHz Spread Spectrum phones are already available for \$125 or so.

Wireless networking could be plug and play (especially when Universal Serial Bus becomes ubiquitous on PC's and digital appliances). At this cost level (about that of a modem), a consumer wouldn't likely have much of an issue paying for another "wireless modem" if it meant that their existing printer(s) and Internet connection could be shared among multiple computers and users.

Best of all, wireless technology can reasonably be expected to be purchased retail, installed by the consumer (again, especially with USB, which is shipped on PC's made since, at least, very early 1997), and simply work right out of the box with few problems.

MICROSOFT GOES WIRELESS?

So, it wasn't too much of a surprise to me that a few days after the Microsoft announcement, I read about a group (that includes Microsoft) calling themselves Home Radio Frequency Working Group (HRFWG). HRFWG will be working on Shared

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Wireless Access Protocol (SWAP), which will be a proposed open standard for wireless voice and data communications in the home.

I think the following quote was telling, and accurate: "To date, adoption of networking technologies in the home has been inhibited by, on the one hand, the high cost and impracticality of wiring, and on the other, by the multiple, incompatible wireless communications standards presently in use."

To that quote I would add that cost is also a very significant factor in the lack of adoption of wireless systems.

HRFWG's schedule is aggressive—it hopes SWAP-compatible products will be available in the second half of 1999. That schedule might be possible, along with the usual suspects of any proposed new PC-related standard. Intel, Microsoft, Compaq, Hewlett-Packard, and IBM are adding some very significant RF expertise—Motorola, Philips Consumer Communications, National Semiconductor, and Harris Semiconductor.

Obviously, I'm optimistic and enthusiastic about HRFWG's and Microsoft's chances to pull this off. However, one downside is that nowhere in the various HRFWG announcements I read was security mentioned.

With the combination of sufficiently advanced encryption, continuing advancements in spread spectrum technology, and using just enough RF power for the system to work reliably within a home, privacy concerns could be relegated to being a non-issue.

HOME SERVERS

Returning to the other part of Microsoft's announcement, it's my guess that the home server will be a VERY hot product category in the very near future.

There's going to be enormous demand to store all the digitized pictures taken with electronic cameras, and then display them on the family's large TV for the relatives.

There will be cached movies for later watching ordered from the satellite, cable, or Internet.

There will be electronic copies of the short lifetime of children's homework and other mementos.

There will be electronic mail that includes short video clips and images.

The cost per Megabyte of disk storage continues to get laughable, but there's no reasonable (read simple...) way for an average home PC user to be able to take advantage of these cheaper, bigger disks. However, if the big, cheap disk is "out there on the home network", then it's VERY easy to take advantage of.

Interestingly, the home server is the piece of digital hardware in the home that's seems LEAST likely to run Microsoft software. That's because you're unlikely to DO very much with the Server, other than treat it like a server. Store files of various kinds on it. Let it handle the e-mail, perhaps. Act as a firewall to the Internet. That's all—pretty routine stuff, and easily handled by a non-Microsoft operating system. There are now several "microservers" available that might be adapted for home use.

COBALT QUBE MICROSERVERS

But none so nearly appropriate for home use as the recently announced Qube Microserver from Cobalt Microserver (www.cobaltmicro.com). I've been expecting to see a product of this type for some time—making use of free, stable, and very capable source code is a powerful competitive strategy, and for this application, Linux is an ideal operating system.

For about \$1,000, a Qube Microserver looks like a Windows 95 or NT system (with file shares) on a network. It also handles the Internet access duties, has a big hard-disk, and is administered remotely from a web browser (it's initially configured with a small LCD front panel).

The QM runs Linux on a MIPS processor with a customized, embedded and upgradeable version of Linux. The QM is a VERY exciting product, and I predict that Cobalt Microserver's approach will be very quickly copied into stripped-down PC systems with no video, bigger hard disks (Quantum now offers a 12 GB IDE disk for about \$400), and Intel processors. They'll use Linux in the same way. I'd expect many clone vendors to offer a home server for very aggressive prices by fall 1998.

The Qube Microserver, and its soon-to-be Intel-based clones, will present another opportunity for on-the-ball ISP's to form long-term relationships with customers. ISP's that make it painless (and indeed, welcoming) for an average person to set up an Internet account for a Qube (and clones, and successors) should do well. Especially in their ability to sell high-margin, add-on services such as remote backup, multiple simultaneous modem connections for faster Internet access, etc. ♦

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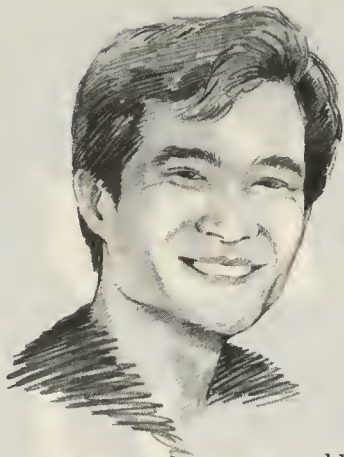
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Notes From The Underground by Wallace Wang

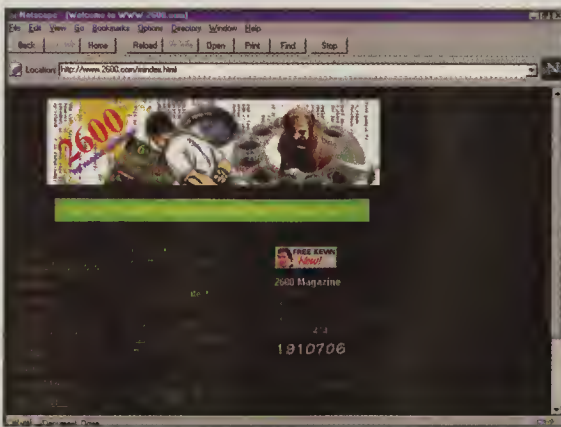
HACKER 'ZINES

Browse through your neighborhood Newsstand and you'll find a variety of magazines covering health and fitness (with covers showing beautiful blondes cavorting with burly weight lifters), food and cooking, coin collecting, military history, and women's problems (usually the first problem is the anemic teenage girl on the cover who makes the magazine's readers feel inadequate).

However, one type of magazine that may be conspicuously absent from your newsstand is hacker magazines. By their nature, hacker magazines attract a limited readership, which causes two problems. First of all, hacker magazines can't attract full-page color ads for Cadillacs or vacations to Hawaii. Secondly, hacker magazines print information that few people care to read or buy, which means newsstands shove them aside to sell the more popular magazines instead.

HACKER MAGAZINES IN PRINT

If you live in a large city, you may be fortunate to find two hacker magazines called *2600* (www.2600.com) and *Blacklisted! 411* (www.blacklisted411.com). *Twenty-Six Hundred* is the older of the two hacker magazines, having been in print since 1984, while *Blacklisted! 411* appeared recently in 1994. Both magazines cover a wide range of topics including virus writing; hacking cellular phones; cracking America Online; BBSs, and the web sites; phone phreaking; and understanding unusual computers used by automated teller machines or companies like Federal Express and Wal-Mart.



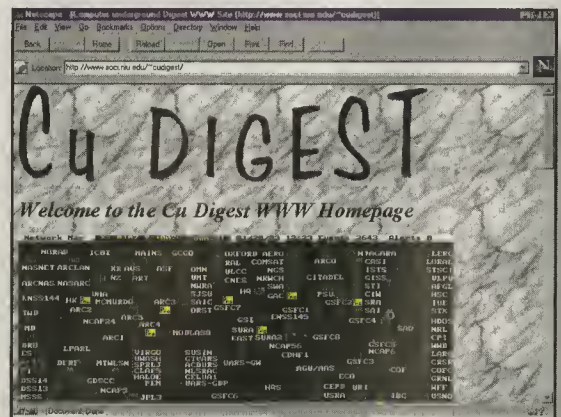
The magazine articles vary drastically in quality and scope from issue to issue, although *2600* tends to have

more articles, while *Blacklisted! 411* tends to fill their issues with lists of BBSs or addresses of companies selling hacker related products.

Although *2600* and *Blacklisted! 411* are just two hacker magazines you can find in print, most hacker magazines are available only as text files. One of the first, and oldest electronic magazines is *Phrack Magazine* (www.fc.net/phrack). Since 1985, *Phrack* has provided information about phone phreaking with articles such as "How To Build a DMS-10 Switch," "Fraudulent Applications of 900 Services," and "Tapping Telephone Lines."

HACKER 'ZINES ON THE INTERNET

Another long lasting 'zine is the *Computer Underground Digest (CUD)* (www.soci.niu.edu/~cudigest), which appears weekly and covers the latest debates, news, research, and discussions of legal, social, and other issues related to computer culture. While CUD isn't technically a hacker 'zine, it does cover much of the same topics as hacker 'zines such as government restrictions for encryption and whether hate mail by racist groups are covered under the freedom of speech.



A more recent electronic hacker magazine is the *Crypt Newsletter* (<http://sun.soci.niu.edu/~crypt>), which originally offered virus source code, but later changed its focus to poking fun at the incompetence of the computer industry and government agencies. Recently, the *Crypt Newsletter* covered the legal actions between rival anti-virus publishers Symantec and McAfee Associates, the waste of money spent by the KGB and the U.S. Army in purchasing virus source code for military purposes, and the latest virus jokes the FBI actually believed represented real and dangerous viruses.

Wallace Wang is the author of *CompuServe For Dummies*, *Visual Basic For Dummies*, *More Visual Basic For Dummies*, *Microsoft Office 97 For Dummies*, and *More Microsoft Office 97 For Dummies*.

When not working with computers, he performs stand-up comedy and has appeared on A&E's *Evening at the Improv* TV comedy show. He can be reached via e-mail at 70334.3672 @compuserve.com, bothekat@aol.com, bo_the_cat@msn.com, or bothecat@prodigy.net

Hacker 'zines generally have short life spans. Typically a group of hackers will band together, write a few articles, paste them together in a text file, and spread their newsletter around the Internet to announce the existence of their group. After a few months, the hackers realize that editing and writing a newsletter is a lot of work with no financial reward, so members start dropping out until the group dissolves altogether. When this happens, their newsletters represent the only record that the group ever existed at all.

To read long defunct hacker 'zines, visit the historic hacker 'zine archives at <http://www.fc.net/phrack/under.htm>. One hacker 'zine, called *40 Hex*, was a one-time, notorious virus writing newsletter that provided information for defeating anti-virus software, explanations of the latest virus writing techniques, and actual source code to the latest deadly new viruses. While the viruses provided in *40 Hex* can still infect and damage your computer, all of these viruses have long since been analyzed by the major anti-virus publishers so today's anti-virus programs will have no trouble detecting and removing them.

Other hacker 'zines available include *The Art of Technology Digest*, *The Cult of the Dead Cow*, *Digital Free Press*, *Chaos Digest*, *Legions of Lucifer*, *National Security Anarchists*, *Phantasy Magazine*, *The Syndicate Report*, *United Phreakers Incorporated Newsletter*, *Vindicator Publications*, and *The WorldView*. By reading these different 'zines, you can get a better understanding about the people who put these newsletters together and the time period in computer history when these 'zines were written.

THE FUTURE OF HACKER 'ZINES

Although so many hacker 'zines have appeared and disappeared over the years, new hacker 'zines continue to pop up all the time. Two of the latest hacker 'zines, dubbed *SLAM* and *Virus Bits & Bytes (VBB)*, explain how to write macro viruses for Microsoft Word and Excel. Much like *40 Hex* provided assembly language source code to viruses, *SLAM* and *VBB* provide source code to macro viruses along with explanations for helping you write better macro viruses on your own.

Hacker 'zines will continue to appear as long as people feel that mainstream newspapers and magazines are ignoring an important point of view. While the level of writing in hacker 'zines can vary wildly, and the information presented may be too technical to understand, hacker 'zines can certainly open your eyes to a whole new world on the Internet. Browsing through these archives of computer history can be educational, interesting, and a whole lot of fun, which might convince you to band together with some friends and start your own hacker 'zine one day as well. ♦

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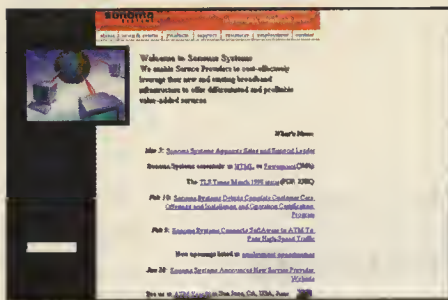


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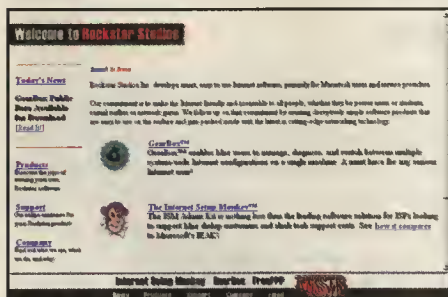
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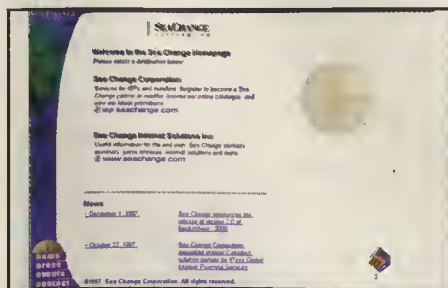
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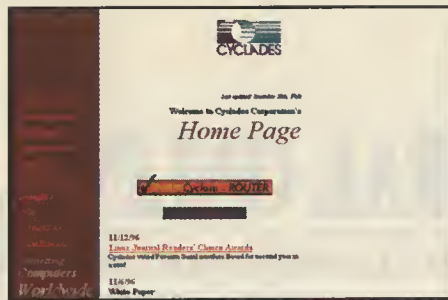
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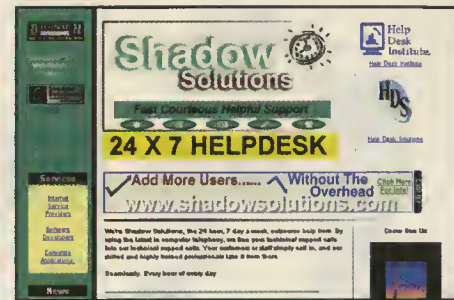
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DVORAK ONLINE by John C. Dvorak

THE FONT CONUNDRUM AND OTHER ISSUES

I'm one of those font freaks who loves to collect fonts and use them whenever possible in as many creative ways as I can. Unfortunately there are a number of catch-22s in the world of fonts.

And all of them are rather unfortunate since, for all practical purposes, fonts are mostly free.

Yes, I know, professionals and typesetters will buy the perfect fonts from Adobe for their jobs, but for the average Joe looking to jazz up a presentation: Fonts are free. If they aren't completely free you can get a tonnage bundled with Corel products and there are many more on the web for quick loading.

This price (free) has caused consternation among vendors who want to make money selling fonts. As an aside I'm amused by Microsoft's activity regarding the font business. While it has added a few nice fonts for the browser world where is the large library of free fonts? All fonts known to man, for example? This company is intent on giving away code for free when it comes to decimating a market (browsers) but curiously stays away from the big giveaway when the market has already been decimated (fonts). Corel managed to destroy the market years ago by bundling a huge font library. Where is Microsoft? But I digress.

The font scene has always been problematic for designers who want to make a cool-looking font. This is because you cannot copyright or protect a font design only the font name. This is why you see so many fonts such as HELV (for helvetica). Or TMS-RMN for Times Roman. Numerous font designs are simply ripped off and renamed. The latest trend in design is to come up with a new jazzy font and hope all the ad agencies in New York buy copies before it is ripped off. A tough business, for sure.

The interesting benefit is good news AND bad news. The good news is that wild-looking fonts are coming out daily. The bad news is people are using them! The original fear when desktop publishing was invented for everyman was that people would not use fonts correctly and all desktop publishing by amateurs would look like a ransom note. This never happened as people stuck to the basics. But some of these new fonts are designed to look like hell. There is an obvious need for horrid-looking design to offset the super-slick look permeating all media. In this I include web sites, which are looking more and more cookie-cutter as each week goes by. These new fonts change that. The problem is that these new fonts must be used as .gifs, not as actual fonts. Nobody has them on their systems and the embedded font technology, which will change the look of the web forever seems moribund.

The idea of embedded fonts allows designers to use some of the weird fonts as text fonts for quick loading. IN fact the web needs more standard fonts as part of the system. Right now too many people have Ariel, Times, uh, and that's about it! Few folk even realize that Verdana, Georgia, Ariel BLACK, Impact and other fonts are available free from Microsoft and are supposed to be used with Explorer. Great fonts such as Tekton and Garamond need to be permanent fixtures on everyone's machines too.

This is the Catch-22 of font collecting. Ok, so I have a lot of cool fonts. What good does it do me if I do everything electronically? If I put them on a web page, you won't see it properly unless you have the same fonts installed on your system. Now I know that they are working on various embedded font technologies, but we have yet to see them and I wonder if they will work as advertised. For example you can embed fonts in many Microsoft documents, but it doesn't work as well as it should because too many fonts themselves have blocking mechanisms which prevent this function to work at all. Sigh.

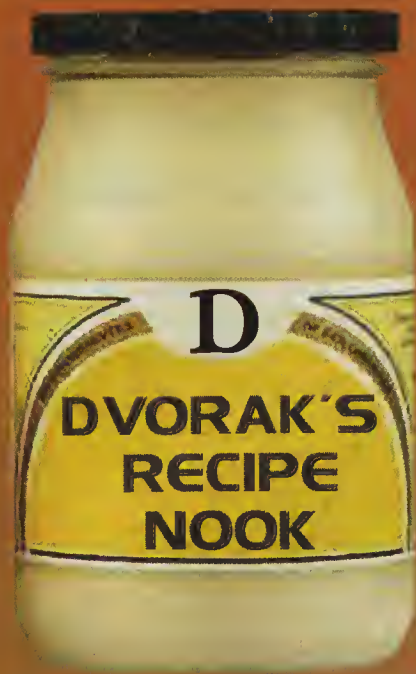
THE BIG ISSUES

Every year I spend the first quarter trying to determine the big issues of the next 12 months, which I can then harp on to excess. This next year I'll be focusing on home networks, web development, new chips and hand-held/pocket computers specifically the Palm Pilot. I would recommend to anyone out there that wants to get on the bandwagon for the "next big thing" to consider the Pilot as a platform for new ideas. The Pilot III in particular is interesting because it has an IR port which can be used for all sorts of interesting apps. One possibility, for example is the following. Download TV Guide from the Web. Embedded in the TV listing are the codes necessary to drive the VCR via the infrared port. This means you can even have the Pilot compare your schedule with desired TV viewing and punch up the Pilot to program your favorite programs while you're gone.

The drawback to this is something I'm reminded of from years ago. When Steve Wozniak retired from Apple he started a company called Cloud Nine which did an advanced VCR programming device and universal IR gun. He once commented, "Wouldn't it be cool if you were travelling and realized that you were going to miss a TV show and could call home and turn on the VCR!" A person nearby said, "It sounds like your watching too much TV to me!"

Perhaps these gizmos are nonsense and we don't need such features in our lives. Hard to say, but you'll be hearing more and more about these things. At least from me.

In addition to his weekly syndicated radio call-in show, *Software/Hardtalk*, syndicated newspaper columns, magazine writing for *MacUser*, *PC Computing*, *DEC Professional*, *Information Technology*, and his featured "Inside Track" column in *PC Magazine*, Dvorak is the author of several best-selling books, including *Dvorak's Inside Track to DOS & PC Performance*, *Dvorak's Guide to PC Telecommunications*, and *Dvorak's Inside Track to the Mac*. John can be reached at dvorak@dvorak.org



by
John C. Dvorak

Ingredients (in order of use)

1 egg
1/4 cup oil
1 tsp salt
1 tsp dry yellow mustard
1 tsp sugar
dash cayenne pepper
1/2 cup oil
3 Tbs lemon juice or vinegar
1/2 cup oil

BLENDER MAYO

As anyone who reads this column knows I promote hand-made, scratch cooking. Somewhere along the line I made some allusion about not making fresh mayonnaise at the drop of a hat and I was called on the carpet for it by a purest. I have mixed feelings about blender mayo, but have to say that Pete Klammer's recipe, an old classic, is a good one. The following are his comments to me AND this old Oster recipe.

Mr. Dvorak: In one of your recipe articles, I think you were trying to distance yourself from Martha Stewartism, when you declared you wouldn't go so far as to whip up fresh mayonnaise on the spot for the kids lunch. (Forgive me for putting words in your mouth; it's been on my mind for quite some time, and I hope I haven't reshaped your expression too badly.) Well, if you have a blender, you can do just that, and I recommend the results to you. I got the recipe from an Oster blender cookbook two or three decades ago, and it's simple enough to keep memorized, while it is reliable and tasty enough to justify the trouble.

Put the egg, dry ingredients, and first portion of oil into a high-speed blender with a tall container. Put the lid on and blend 10-15 seconds until the mixture is smooth and light yellow (it will spatter up the sides of the container some-use a rubber spatula to scrape this back down). Gradually drizzle in the second portion of oil; the mixture will become too thick for the blender to keep moving. Add the lemon juice or vinegar, stopping the blender to stir the liquid down to the blades if necessary. Blend until uniformly mixed; use the rubber spatula if needed. Add the final portion of oil and blend at highest speed until completely mixed, stopping to scrape down the sides as needed.

Klammer likes using tasteless oils such as Safflower. I'd prefer a good olive oil. Whichever you use. This recipe does work!



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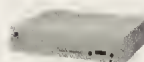
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